The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Lessons of the London Conference

IF the purpose of the Chemical Industry Conference concluded in London on Tuesday was to challenge the view of Lord Balfour that this country has not been sufficiently alive to the importance of research and to the industrial application of its results, it succeeded to an almost embarrassing degree. For leaders like Sir Alfred Mond and Sir D. Milne-Watson, the one the head of the largest chemical combine in existence, the other the head of the largest gas undertaking in the world, had no difficulty in showing, not only that this country has a wonderful record in scientific discovery and invention, but that it has led the world in many of the most important industrial developments. There is a touch of irony in the fact that the Chemical Industry Conference of 1928 should have disproved, by the evidence of some of its greatest industrialists and scientists, the generalisations of the distinguished Messel Lecturer of the Chemical Congress of 1926. Similarly, if the conference was intended to convince the lay public that British chemistry and chemical industry really mean something, it attained a considerable degree of success. The newspapers took note of the proceedings, and accepted the evidence offered by experts and authorities that the old worship of Germany has been replaced by a more accurate appreciation of the work of our own chemical schools.

It was inevitable that, in the pursuit of these rather general public aims, the Conference should have suffered a little on its specifically scientific side. The publicity achieved, if the truth must be faced, was not due to the disclosure of any fundamental scientific results; it was due to the fact that several of the selected speakers were men whose words are usually recorded, whatever platform they happen to speak from. The one notable scientific contribution to the Conference was that of Professor G. T. Morgan, director of the Government Chemical Research Laboratory at Teddington, on the research work of his staff into the constitution and characteristics of low temperature tar. This is the second public account that Professor Morgan has given of his work at Teddington, and it confirms the impression made by his earlier paper on high pressure synthesis that his work is proceeding on sound lines, that he has collected a team of enthusiastic and able research workers, and that as time goes on results of importance may be expected to emerge. The paper impressed the Conference in three ways. It revealed an admirable plan of research methods, quiet, patient, non-spectacular investigation into facts, beginning at the bottom and proceeding step by step along carefully verified ground. It presented the methods and the results with perfect clearness, and though essentially scientific in spirit, indicated here and there, even at this early stage, possibilities of industrial application which it is the function of the industrialist to explore further. Further, it should be noted that these results are made known for the benefit of all and have therefore a disinterested public value not possessed by purely private investigation. In the short period of two years Professor Morgan and his staff have done remarkably well, and the cordial recognition their work received at the Conference must confirm and encourage them in their efforts.

While, in the sense we have indicated, this record of research into low temperature tar was the one strictly scientific contribution, many of the other papers and speeches were of great general scientific interest. Taken together, they must have made the Conference sensible that already chemical science is entering a new era. For the past few years we have been talking of the great achievements forced on by the war. Already these are becoming familiar. The dyestuffs industry, which a few years back was a national problem, necessitating a special Act of Parliament, is now taken for granted—an unconscious tribute to the excellence of the work done. Nitrogen fixation again, has become a commercial commonplace even to the layman. The liquefaction of coal, the novelty of yesterday, would today be accepted without astonishment. These and other things of the same order are great achievements in themselves, but they involve something even greater. They have brought into existence an entirely new and vastly more powerful chemical technique,

which brings within effective range problems hitherto treated as remote. From Sir Alfred Mond, Colonel Pollitt, Mr. Carr, Sir D. Milne-Watson and others who are breaking up new ground, one heard of new possibilities that surround the chemist of to-day on every side. There probably never was a stage at which chemistry was confronted with so many potentialities of success in so many directions. The Conference has done something worth while if it has done no more than make chemists sensible of this new world into which they have passed so quietly and with such speed, and to hearten them for the task of converting its possibilities into industrial realities.

Chemical Trade Still Improving

THE Board of Trade returns for April, in relation to chemical overseas trade, are still satisfactory, and indicate a steady recovery of business. The imports of chemicals, drugs, dyes, and colours in April show an increase of £69,099 over those for April of 1927, but against this there is an encouraging increase of £116,067 in exports and of £3,650 in re-exports. Taking the figures for the first four months of this year, in comparison with the corresponding period of last year, chemical imports have declined by £324,175, exports have increased by £981,063, and re-exports have increased by £17,760. The improvement for some time past has been so consistent that one may reasonably infer a growing sense of stability and confidence, with the improvement that invariably follows from this condition.

As regards details the decline in imports is principally confined to the drop in coal tar products from £190,137 to £47,337, which to some extent balances the increase in other items. On the exports side, the principal increase is in sulphate of ammonia, which has risen from £146,935 to £268,446. The increase is most marked in the cases of Spain and the Canaries, Dutch East Indies, Japan, and British West India Islands. The only decrease, a slight one, is in the Italian market. France appears to have permanently disappeared from the consuming countries. There are substantial advances in the exports of tartaric acid, ammonium chloride, benzol and toluol, carbolic acid, and naphthalene, but a remarkable decrease in the case of tar and creosote oil from £274,468 last year to £6,353 this year. Potassium compounds are virtually the same, but sodium compounds are up from £246,029 to £338,527. Drugs are rather better, and dyestuffs have advanced from £56,402 to £69,239. Painters' colours again, usually a strong branch, though slightly below last year's figures, are well above the 1926 level. In the re-exports tables, there is an increase in coal tar products from £458 to £15,694. There is also a notable increase in potassium nitrate from £61 to £2,403 and in miscellaneous items from £10,143 to £24,385.

New Chemical Products

IN the review of British Chemical Trade in 1927 by Mr. Homer S. Fox, the United States Trade Commissioner in London, of which some mention was made in our last issue, there is a passage relating to British pharmaceutical and fine chemicals, in which attention is drawn particularly to the growth of Vitamin production on a commercial scale and to the large-scale output in irradiated ergostel, or radiostol, making synthetic Vitamin D commercially available, and the production by British chemical manufacturers on a large scale of Vitamin A. Among the alkaloids, it is stated that ephedrine is being produced by three British firms, and one firm is stated to have taken up the production of cocaine, and a second the manufacture of quinine. As regards dyestuffs, attention is particularly drawn to the new ranges of colours brought out by the British Dyestuffs Corporation and Scottish Dyes, Ltd., and mention is also made of the silicon ester paints developed by Albright and Wilson for the preservation and colouring of stonework and concrete.

Among other new products mentioned is a new type of bleaching powder, which is claimed to be able to preserve its strength in hot climates and production of which has been started on a small scale, with development on a much larger scale expected in the near future; a number of new disinfectants and insecticides; and one or two new departures in the manufacture of moulding powders and products therefrom. The production of various commodities, such as non-inflammable film, from a cellulose acetate base has been announced, both in connection with the manufacture of acetate silk and independently, but commercial development in this field in Great Britain it is added, has not been pronounced, although more rapid progress appears to be possible within a year or two.

Books Received

PROCEEDINGS OF THE CHEMICAL ENGINEERING GROUP. Vol. 8. London: Society of Chemical Industry. Pp. 127. 10s. 6d.

THE MODERN CALORIMETER. By Walter P. White. New York: The Chemical Catalog Company, Inc. Pp. 194. $4.00.

LES GRANDES INDUSTRIES MODERNES. TOME V.: LES INDUSTRIES CHIMIQUES—LE REGIME LEGAL DES ENTENTES. By Paul de Rousiers. Paris: Librairie Armand Colin. Pp. 252. 12 fr.

BRITISH CHEMICAL ABSTRACTS. INDEX 1927. London: Bureau of Chemical Abstracts, Central House, 46, Finsbury Square, E.C.2. Pp. 514.

VARIATION OF PHOSPHORIC OXIDE CONTENT OF SOUTH AFRICAN VEGETATION. By Dr. J. P. van Zijl. Union of South Africa: Department of Agriculture. Pp. 11.

SOME EFFECTS DUE TO THE SPRAYING OF FRUITS. By P. R. v d. R. Copeman. Union of South Africa: Department of Agriculture. Pp. 6.

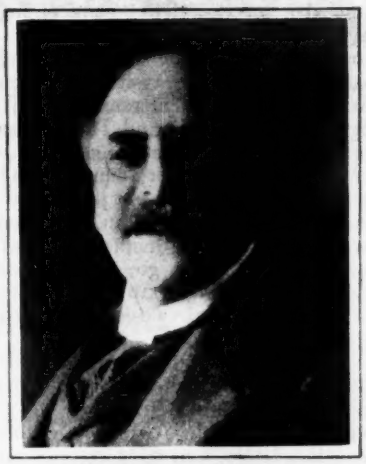
SOUTH AFRICAN TANNING MATERIALS (THE BLACK WATTLE). By C. O. Williams. Science Bulletin No. 63. Union of South Africa: Department of Agriculture. Pretoria. Pp. 68. 6d.

The Calendar

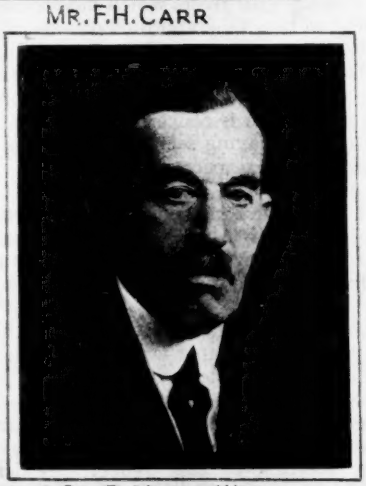
May 19	Mining Institute of Scotland. 3 p.m.	Royal Technical College, Glasgow.
21	Institution of the Rubber Industry. Lecture by Dr. H. A. Winkelmann. 7.30 p.m.	Institution of Mechanical Engineers, London.
25	Royal Institution: "Engine Knock and Related Problems." A. C. Egerton. 9 p.m.	21. Albemarle Street, London.
25	Society of Chemical Industry (Glasgow Section): Address by Principal Sir J. C. Irvine.	Glasgow.
25	Physical Society. 5 p.m.	Imperial College, London.
31	University of London: "Chemical Kinetics." Course of 3 Lectures by Professor Max Bodenstein. 5.30 p.m.	London.
June 7	Chemical Society.	Burlington House.
26	National Physical Laboratory: Annual Visit of Inspection. 3 to 6 p.m.	Teddington.

Prominent Figures at the London Conference

MR. F. H. CARR

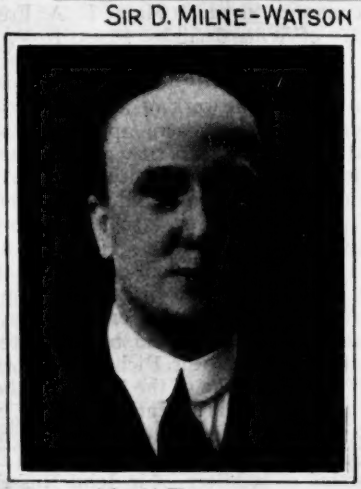


SIR ALFRED MOND

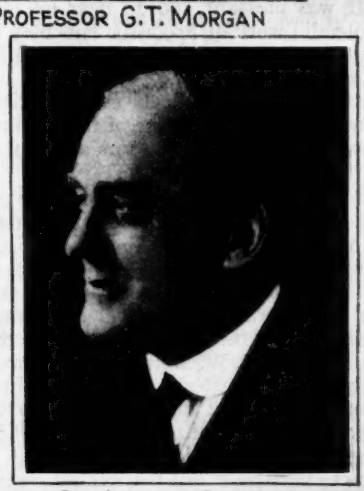


SIR D. MILNE-WATSON

PROFESSOR G. T. MORGAN



MR. H. TALBOT



SIR ARTHUR DUCKHAM

Chemical Industry Conference in London

Some Impressions of the Meetings

THE chemical industry conference in London, which began on Friday, May 11, and concluded on Tuesday afternoon, was generally pronounced a success. The chemical engineers' dinner on Friday evening, followed by Mr. Carr's address, the inspection on Saturday of the Rothamsted Experimental Station at Harpenden, the visit to the Zoological Society's Gardens on Sunday, the conferences in the Institution of Civil Engineers on Monday and Tuesday, and the conference dinner on Monday evening, made up a varied programme, in which every member found something of interest. The home members who do not propose to attend the official annual meeting in New York in September have been furnished with a satisfactory unofficial annual meeting in advance, and those who do go, having done their duty already, may lightheartedly skip the technical sessions in America and spend their week in visits to China Town and other centres of attraction.

The arrangements for the conference were undertaken jointly by the Society of Chemical Industry, the London Section, the Chemical Engineering Group, and the Institution of Chemical Engineers, and they co-operated very well together. The stewards worked faithfully to a carefully compiled "book of words," and so well had every need been foreseen that it seemed almost impossible for anything to go wrong. Nothing, in fact, did go wrong, except where announced speakers or chairmen contracted mumps or gout or measles and so deprived us of the pleasure of their company.

Nothing could have been happier than the send-off to the conference supplied by those hearty fellows the chemical engineers at their annual dinner. Here we found that early and energetic advocate of the chemical engineering idea, Mr. Harold Talbot, installed in his rightful place of chairman of the Group, able to look back on ten years of rather wonderful achievement and to look forward with great hopes to the future. Mr. Talbot has tried earnestly to conceal his real gifts as an organiser, and the volume and unselfishness of his work, but he has at last been found out. He was never happier or in better form than in the chair on Friday evening, and his success gave much pleasure to his many friends. It was pleasant, too, to hear his deserved tribute to the splendid work of Professor Hinchley in connection both with the Group and the Institution. Mr. F. H. Carr's demonstration of the action of ultra-violet light on chemicals and its physiological effects as a substitute for sunlight was a very interesting feature of the evening, and he also added somewhat to his repute as a raconteur.

There was a large and interested audience at the opening conference on Monday morning in the beautiful rooms of the Institution of Civil Engineers. Sir Hugo Hirst, who presided, was, one regretted to learn, far from well, and Sir Arthur Duckham, down for the first paper on the relation of chemical engineering to the fuel industries, was also unfortunately absent through illness. His contribution was presented by Dr. E. W. Smith. The feature of the session, however, was a masterly account by Professor G. T. Morgan of the research into low temperature tar carried out under his direction at the Research Laboratory at Teddington. Although strictly a scientific paper, describing in exact chemical detail the work done and the results obtained, it was stated with admirable simplicity and clearness, with many touches of humour, and was illustrated with a number of diagrams and a beautiful collection of specimens. The ovation which greeted him at the close expressed the conference's sense of the excellence of his exposition, of the value of his work at Teddington, and of the efforts of himself and his staff to make the paper a credit to the occasion.

The papers on "Water Purification" and "The Pollution of Tidal and Non-Tidal Rivers," read respectively by Sir Alexander Houston (Director of Water Examinations to the Metropolitan Water Board) and Mr. J. H. Coste (chemist to the London County Council) at the afternoon session, were peculiarly apt at a time when the question of the disposal of factory effluents is so much to the fore. The chair was occupied by Lord Desborough (truly described by Sir Alexander Houston as "that great lover of rivers"), to whom, as chairman of the Thames Conservancy Board, Londoners owe an enormous debt for preserving the amenities of the Thames and the purity of its waters. In outlining the steps that had been taken at various times for the preservation of those amenities, he showed how the necessary powers had only been acquired by extensive legislation over a long period; and from his remarks and those of the subsequent speakers it was clear that the task of dealing with rivers which have already been polluted is going to be a long and difficult one. The two papers indicated how arduous is the task of public bodies whose duty it is to deal with water, whether for the purpose of supplying the public with its needs, or to prevent pollution. As far as London is concerned, however, it is in the enviable position of having set a standard which has made its services in this respect world-famous.

On Tuesday morning the proceedings began with a paper by Sir Alfred Mond (just back from the International Nitrogen Conference) on the application of scientific research to industry. Lustre was lent to this meeting by the presence in the chair of Sir Ernest Rutherford, whose fundamental investigations on the structure of matter have made his name famous, and who is president of the oldest scientific body in the world, the Royal Society of London. Sir Alfred Mond gave a most striking instance of the value of all pure research to applied science when he mentioned the war-time production of ammonium nitrate. The solution of this difficult problem was due to the brilliant manner in which Major F. A. Freeth applied his knowledge of Willard Gibbs' Phase Rule. The chairman did not miss this striking tribute to pure science, and later on referred triumphantly to the fact that such importance should attach to the work of a mathematician like Gibbs, whose original papers were apparently so remote from practical life that for years they remained unknown even to academic chemists and physicists. Sir Alfred Mond, in urging the need for research and yet more research, said that the I.G. carried it out on a scale that would make most company chairmen shudder. He did not fail, however, to indicate that research alone could not make the wheels of industry go round. The investigator and the works manager must sympathise more with one another, in order that technical investigations could be translated into terms of large-scale operation. Sir Richard Gregory, in proposing a vote of thanks, spoke of the battle for the recognition of science by the pre-war scientific workers, whom he aptly described as "the Old Contemptibles"; no less apt was his description of Sir Alfred Mond not as a captain but as a field-marshal of industry. Sir John Russell was unfortunately unable to be present, but his paper on the part played by British workers in the application of fixed nitrogen to the soil was ably presented by Dr. B. A. Keen, of the Rothamsted Experimental Station.

Colonel Pollitt, of Billingham, at the closing session in the afternoon, had a large audience for his paper on "Developments in the Heavy Chemical Industry." Many were secretly hoping to hear something of the new work being done at Billingham, but the speaker never even mentioned the name, and the only liberty he allowed himself was a prophecy that coal liquefaction was very near commercial solution and that the lack of cheap water power would be made up for by the chemical uses of cheap coal. Historically, however, the paper was a document of great interest, for it defined with clearness and knowledge the numerous changes now being introduced by chemical processes, the remarkable achievements of the past few years, and the even greater achievements open to the chemist in the near future. Mr. Tizard, who presided very happily over the session, emphasised the last point mentioned, and added at least one new fact about Billingham. He told us that only four classes of people were allowed to visit the works—parsons, women, lunatics, and Government officials—though he himself had not yet enjoyed the privilege. The paper, as he remarked, made "a fitting conclusion to a very successful conference." Colonel Pollitt's paper will appear in full in our annual Merchant Shippers' Issue next week.

The Conference Dinner at the Connaught Rooms on Monday evening was a great success. The company was one of the largest and most representative we have seen for some time, and the speaking, though mostly in a serious vein, was listened to with sustained interest, and finished in time to allow a couple of hours of dancing. Mention should also be made of the pleasant Press luncheon on Friday, at which short speeches were made by Mr. Carr (president), Mr. Woolcock, and Dr. Armstrong.

Annual Meeting of the Chemical Engineering Group

Increased Membership and Extended Activities

As an introduction to the Chemical Industry Conference in London, organised by the Society of Chemical Industry in co-operation with the London Section, the Chemical Engineering Group, and the Institution of Chemical Engineers, the annual general meeting and dinner of the Group was held at Les Gobelins Restaurant, Regent Street, London, on Friday evening, May 11. Mr. H. Talbot (Chairman of the Group) presided.

Report for the Year

The report of the Committee for 1927 stated that the membership had increased by 12 to 459, and general satisfaction was expressed at the success of the Group and the great interest displayed by the members, as shown by the large attendances at both the London and provincial meetings. Although the Data Sheet Committee had not met during the year, the work on new and original data sheets had made progress. The report gave details of the 12 meetings held during the year and special attention was drawn to the fact that several papers, notably Dr. Ormandy on "Chemical Fire Extinguishers," Scott, Garret and Riley on the "De Vecchis Process," and Reavell on "Spray Drying," were on subjects expounded fully for the first time. Reference was also made to the fact that the Group had continued its policy of co-operating with other learned bodies and local sections of the parent Society, visits in this connection having been paid to Bristol, Edinburgh, Glasgow and Liverpool.

Regret was expressed at a small excess of expenditure over income mainly due to the greater expense attached to the Group's increased activities. In the meantime, the balance was more than made good by the amount brought forward from 1926. Appreciation was expressed at the assistance and interest given to the Group's work by the President and Council of the Society, and recognition was given to the assistant secretary (Mr. Mackie) and the office staff for loyal and efficient work during the year.

On the motion of the Chairman, seconded by Mr. Arthur Reavell, the report was adopted.

Mr. F. A. Greene (hon. treasurer) presented the accounts for the year and stated that the Group, having received so much service from the Institution of Chemical Engineers, had given a donation towards the Institution's expenses, otherwise the balance would have been on the right side. On the motion of Mr. Yeoman, seconded by Mr. Tungay, the accounts were adopted.

Mr. H. Talbot was elected Chairman; Mr. H. J. Pooley, hon. secretary; and Mr. F. A. Greene, hon. treasurer.

On the motion of the Chairman, seconded by Mr. Arthur Reavell, the following were elected to the Committee:—Mr. W. A. S. Calder, Mr. F. Esling, Professor W. E. Gibbs, Mr. S. G. M. Ure, and Mr. J. E. F. Bogel.

On the suggestion of the Chairman, it was unanimously decided to send a message of greeting to Professor Williams, who had to resign from the chairmanship of the Group during the year owing to his taking up an appointment with the Shell-Mex Co. in California, expressing regret at his departure but wishing him success in his new sphere of work.

The Annual Dinner

The annual dinner followed, presided over by Mr. H. Talbot, who gave a hearty welcome to the many guests present, including Mr. F. H. Carr (President of the Society of Chemical Industry) and Sir Alexander Gibb (President of the Institution of Chemical Engineers).

Mr. F. A. Greene, proposing "The Society of Chemical Industry," spoke of the good relations now existing between the Society and the Group, and assured the Society of the fullest assistance and co-operation from the Group on every possible occasion.

Mr. F. H. Carr, responding, said that the Society had benefited very much from the assiduous work of the Group on behalf of the chemical industry, and many of those associated with the formation of the Group had worked with great success in the interests of the industry as a whole, long before the great idea of chemical engineering received recognition. In connection with the Chemical Industry Conference he wished to acknowledge the fact that the whole of the arrangements had been undertaken by members of the Group. Finally, Mr. Carr paid a tribute to the excellent work of Mr. Talbot.

Sir Alexander Gibb, proposing "The Chemical Engineering Group," recalled how it was started nearly ten years ago and now had a membership of nearly 500. Thanks largely to the work of the Group, enormous strides had been made in this country in chemical engineering, and whereas before the war there was a tendency on the part of foreign nations to steal the results of our laboratory research and apply them, the position had completely changed, and we were making practical use of the results of research in this country and getting down to real work of that kind. Mr. Talbot had practically driven the Group to success in face of all opposition, and it was to be hoped that he would long be spared to continue the good work he was doing.

Mr. Talbot, acknowledging the toast, said that although he might have played a small part in the development of the Group, the success that had been attained was really due to the members themselves, and particularly to the members of the Committee. The Group had very nearly reached its tenth anniversary, and he recalled how a meeting had been held at the instance of Professor Hinchley, to whom the credit was due for starting the Group, and to whom also was due the credit for the formation of the Institution of Chemical Engineers. It must, therefore, be very gratifying to Professor Hinchley to hear the President of the Institution of Chemical Engineers proposing the toast of the "Chemical Engineering Group." It was probable that Professor Hinchley would never get the proper reward in this world for the development that he had been responsible for in chemical engineering, and he could only hope that something good would be saved up for him in the hereafter. (Laughter.) Events had shown that

the Group had amply justified itself. For instance, when the first professor of chemical engineering was appointed under the Ramsay Memorial Scheme, a member of the Chemical Engineering Group, Professor Williams, was selected for the post, and now that a successor to Professor Williams was required, another member of the Group, Professor Gibbs, had been appointed. (Applause.) Again, the first President of the Institution of Chemical Engineers was a member of the Group, as was the second, and, said Mr. Talbot, amid laughter, turning to Sir Alexander Gibb, "Why are not you?" Mr. Talbot said that experience had shown that there was something in the Group idea, and by co-operation with the parent Society and other bodies he looked forward to this good work being continued. (Applause.)

Mr. F. H. Carr then gave a short address on "Some Chemical Engineering Aspects of the Fine Chemical Industry." illustrated by demonstrations. Owing to lack of time he was unable to deal with the many matters he had intended to, and confined himself to some comments upon the use of ultra-violet light in chemical industry, and on the relation of vitamins to health. By the kindness of Kelvin, Bottomley and Baird he was able to show a mercury arc lamp and demonstrate some of the uses to which it could be put in detecting impurities in various substances. Paraffin wax, table jellies, zinc white, eggs, artificial and natural silk, and a number of other substances were placed under the ultra-violet rays, and the audience was keenly interested in noticing the fluorescent effects produced.

Chemical Industry Conference: Monday Sessions

Fuel, Tar, and Water Problems

THE first session for the reading of papers was held at the Institution of Civil Engineers, Great George Street, London, on Monday morning, Sir Hugo Hirst presiding.

Engineering Co-operation

The chairman, in opening the proceedings, said that so far as pure science was concerned, we were not behind any other country in the world, but so far as the application of chemical science was concerned there was a tremendous amount of work to be done, and that involved linking up with the physicist, the metallurgist, and the engineer. Speaking as an amateur, it seemed to him that the task the country expected the chemical engineer to solve was to instal King Coal to his old might and power. In solving that problem, the chemical engineer or the chemist would have to work with the electrical engineer who wanted cheap power from coal, with the gas engineer who wanted cheap gas, with the mining engineer, the oil engineer, the fertiliser engineer, the smokeless fuel engineer, and every type of engineer. There would have to be co-operative work to solve this problem, and one day it would be necessary for those engaged in the various branches of industry dependent upon coal to come forward with their big cheques and subscribe £250,000 or more in order that co-operative work might be done in regard to coal, as the Germans were doing today in connection with the Bergius process and lignite. He visualised that instead of importing £40,000,000 worth of oil we might be producing benzol out of our coal and offering cheap power and cheap gas to every industry in the country. Only in that way could we anticipate the rejuvenation and resurrection of the position that England once held in industry. It all depended upon the right use of coal and on the proper utilisation commercially and industrially of the by-products.

The Chairman explained that Sir Arthur Duckham was to have read the first paper, but unfortunately he was prevented by illness from being present. During the war Sir Arthur and himself made very deep studies of the possibilities of producing nitrates in this country in case the submarine warfare prevented the importation of nitrates from Chile. They got togther a few people, spent a good deal of money, and got an amateurish scheme ready which, thank God, was not wanted. Nevertheless, the lines on which they then proceeded seemed to him to be the lines upon which chemical engineers and chemists would have to work in collaboration with others.

The Chemical Engineer and Fuel Problems

Dr. E. W. Smith read Sir Arthur Duckham's paper on "The Fuel Industries and the Work of the Chemical Engineer." It was pointed out that in investigating the fuel industries, the work of the chemical engineer was of great importance. The cleaning of coal by either dry or wet processes, the efficient carbonisation of coal, the preparation of oils from coal, the manufacture of pig iron, the manufacture of steel, and the heating of kilns and furnaces were all propositions wherein the specialised knowledge of the chemical engineer was needed. In the carbonisation industries, for example, there were at present a number of problems requiring the work of chemical engineers. The preparation of satisfactory refractory materials with good jointing and patching cements to meet all reasonable temperature conditions, methods for rendering sulphate effluent innocuous, a method of liquid purification of gases from sulphur compounds, the manufacture of a dense, ash-free, easily-ignitable smokeless fuel, the preparation of a suitable cheap metal, presumably iron, which would stand up under working conditions of say, 750° C. for a thousand days, were typical problems which require solution.

Again, there was the problem of the preparation of oils from coal. Those who had followed the development of such processes as that invented by Bergius must realise the immense amount of work that had been done, but must also realise the immense amount that lay ahead in order to make the process truly economical. Numerous problems that arose were capable of solution only by close working between the laboratory and the works plant. Only by practical experience could the difficulties be discovered; only by a sound knowledge of chemistry and engineering could they be overcome.

"Let us," he said, "appreciate the necessity for chemical engineers in the fuel industries. Let us create the demand; I am sure it will be met. We must treat these men well. High salaries properly earned are a sound investment. In any of the operations I have mentioned, a good man can earn a good salary many times over."

Chemical Study of Low-Temperature Tar

Research Work at Teddington

The second paper was by Professor G. T. Morgan, Director of the Government Chemical Research Laboratory at Teddington, and it was illustrated by slides and an extremely interesting collection of chemical exhibits. In the course of the paper it was pointed out that the research under review had been in progress at the Chemical Research Laboratory, Teddington, since the beginning of 1926. The tars and tar distillates, which had been supplied in large quantities by H.M. Fuel Research Station, were representative products of low-temperature carbonisation derived from two typical coals. The object of the research was to increase our knowledge of the original constituents of low-temperature tar. Since certain of these components underwent distinctive changes on heating, separation by solvents had been substituted for separation by distillation. In the solvent treatment the highest temperature employed did not exceed 120° C. A tar treated in this way with such volatile solvents as ether, petroleum, and acetone, left, after removing acidic and basic constituents and neutral oils, only 5.4 per cent. of amorphous solid, whereas when fractionated by distillation under ordinary pressure, it gave 31 per cent. of pitch.

Among the solid aromatic hydrocarbons, two homologues of anthracene had been identified, namely β-methylanthracene and 2:6-dimethylanthracene. A preliminary study had been made of the more volatile bases and the following had been identified: aniline, α-picoline, 2:4- lutidine, *sym*-collidine, quinoline and quinaldine. The phenolic constituents and their chloro-derivatives had been examined in regard to both chemical and bacteriological properties.

A summary of the results showed that by solvent methods of separation the percentage yields of several potentially

(*Continued on page* 455)

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useful constituents of the tars had been notably increased. The waxes obtainable by ordinary methods of freezing out represented about 1·7 per cent. of the tar. The yield of solid higher aromatic derivatives from undistilled tar was now 1·2 per cent. and might be increased still further. The bases of low-temperature tar had been divided into two groups, volatile amines and resinamines. A method had been evolved for separating by a simple economic process the true phenols from their phenate soluble impurities. The penols themselves had been separated into crystallisable phenols and amorphous resinols, both of which were likely to receive industrial application.

A Retort to Criticism

Professor Morgan added that when he first started this work his staff consisted of two chemists, one who was engaged upon the chemical examination of tar, and the other upon the bacteriological study of the phenolic constituents. Since then others had been engaged and the staff now consisted of five chemists and three laboratory assistants. There was also a well-equipped workshop and an efficient workshop staff which had made it possible to carry out a considerable portion of the researches reviewed in the paper on a semi-works scale. The researches were still in progress and were being pursued in collaboration with the Fuel Research Station and formed part of the Government scheme for the scientific investigation into the utilisation of our national resources in coal. The tars had all been obtained from the Fuel Research Station, and he wished to express his thanks to Mr. Sinnatt, Captain Shaw and Mr. King for their assistance in this connection.

Referring to some of the work done on the waxes, Professor Morgan said that this had now been abandoned. Professor Armstrong had a short time ago written to a leading organ in the chemical industry and stated that this work was a waste of time. He never disagreed with Professor Armstrong because he had far too great a filial respect for him. No doubt many researches of this character were a waste of time, but probably ·09 of these wasteful researches brought in a golden harvest which paid for all the rest. (Applause). He did not know whether the learned men who were carrying on this work would be successful—probably they were more likely to be successful in winning the Calcutta sweepstake—but it was just as well that people doing such work should not be discouraged too much. (Applause.)

The results in the paper represented two years work only and were incomplete and of an exploratory nature. An intensified study of low-temperature products was still in progress and even since the paper was prepared, one or two new constituents had been identified. The Chairman had stated that it was not merely a matter of finding out what these constituents were but that it was also a question of applying them. With that he fully agreed, but it was impossible to apply them until we knew what they were, and it was that work which his colleagues were doing. It was up to others to bring about the application of the results obtained and all that was claimed was that there was a certain method in the madness which had perpetrated such an involved chart as he had exhibited. After all, knowledge was power, and those who knew most were the most likely to apply it in the most profitable manner.

There was no discussion upon either paper but on the motion of the Chairman a hearty vote of thanks was accorded to Sir Arthur Duckham and Professor G. T. Morgan.

Dr. Smith, replying on behalf of Sir Arthur Duckham, said he was quite sure he was expressing Sir Arthur's view very definitely when he stated that the chemical engineer was one who was chiefly engaged in trying to make practicable such work as that described by Professor Morgan. It must not be overlooked, however, that before the industrialists and the chemical engineer could start business at all, such work as that described by Professor Morgan must be fully financed and encouraged, and he personally strongly deprecated any ill-considered judgment of the utility of the work which was being carried out by recognised competent experimentalists. (Applause.)

Professor Morgan also acknowledged the vote of thanks and on the motion of Mr. F. H. Carr (President of the Society of Chemical Industry) a hearty vote of thanks was passed to Sir Hugo Hirst for presiding.

Water Purification

In the afternoon papers dealing with water purification and rivers pollution were read. Lord Desborough (Chairman of the Thames Conservancy Board) presided.

Sir Alexander Houston in his paper on this subject said that the improved purity of London water was not only due to better service, but also to storage, which purified the water by sedimentation, equalisation, and de-vitalisation. One disadvantage of storage was that it sometimes led to the development of algal and other growths. These, harmless in themselves, might interfere with filtration, and give the water an unpleasant taste.

Most of the water was filtered through fine sand at the slow rate of less than 2 gallons per sq. ft. per hour. At the new works at Walton there was a double system of filtration, first through rapid filters at the rate of 120 gals. per sq. ft. per hour, then through slow sand secondary filters at 5 gals. per sq. ft. per hour. The rapid filters removed most of the grosser suspended matters, including algal and other growths, and thus prolonged the life of the secondary filters. Phenomenal quantities of water could be filtered by this double process between successive cleanings of the secondary beds, the average being actually 445 million gallons per acre. The chemical and bacteriological results were not quite so good as those obtained by the older method, but chlorination was employed as a final safeguard.

Chemical Purification Methods

Chlorination was first used at Lincoln in 1905. The following methods had been tried successfully :—Chlorine alone; ammonia and then chlorine to the whole volume of water being treated; ammonia and chlorine added to the minor volume of water, then adding the mixture to the rest of the water to be treated; chlorine and permanganate, the latter being added before, during, or after the chlorine treatment; ammonia, then chlorine, then permanganate; super-chlorination and then de-chlorination.

In the excess lime method, the principle was to add a little more lime than was required to combine with the bicarbonates, thus killing the microbes. The water was next carbonated and then filtered at a very rapid rate. At Langford the results showed that the ammoniacal nitrogen and albuminoid nitrogen figures were practically halved, the oxidisable matter reduced 68 per cent., the colour 75 per cent., the hardness 59 per cent., and over 99 per cent. of the bacteria removed or destroyed. Where it was considered essential to soften as well as purify an impure hard water, the excess lime method had perhaps no equal.

Pollution of Tidal and Non-tidal Rivers

Mr. J. H. Coste in a paper on this subject contended that no River Board was doing its duty if it did not continually satisfy itself not only that the standards for effluents were observed, but that they were adequate for preserving the river in a normal condition under all variations of fresh water flow and temperature. The main points were that the potential polluters must know what they might and might not discharge into the river, and the river authority must be satisfied that its requirements are complied with and that they were both adequate and reasonable.

There was no discussion on the papers.

I.C.I. Booklet on Liquid Chlorine

It was as recently as 1909 that the liquefaction of chlorine was first accomplished on a commercial scale in this country. From that time chlorine became a convenient raw material to handle. A booklet, *Liquid Chlorine*, published by Imperial Chemical Industries, Ltd., gives details of the properties of liquid chlorine, its uses, and the care of cylinders, valves, etc. It will be found of great interest, and the illustrations help to make the explanations clear. Readers who mention this journal can obtain a copy post free on application to the Publicity Department of Imperial Chemical Industries, Ltd., Kings Buildings, Smith Square, London, S.W.1, or to the Sales Offices of the company situated in Belfast, Birmingham, Bristol, Dublin, Gateshead-on-Tyne, Leeds, Leicester, Liverpool, London, and Manchester.

Papers and Discussions at Tuesday's Conference

Sir Alfred Mond on British Chemical Achievements

The Conference was resumed at the Institution of Civil Engineers on Tuesday, when Sir Ernest Rutherford presided.

Applying Research to Industry

SIR ALFRED MOND, M.P., in an address upon this subject, first referred to the suggestion made by Lord Balfour that although we in this country had always excelled in pure science, we had been somewhat laggard in applying science to practical purposes. That suggestion, he said, could be argued both ways as regards this country and others. Science was not a national affair; it was a human affair, and at any given moment the scientists of one country might be ahead of those of other countries, or one country might be ahead in the matter of the application of science. It was satisfactory to know that there were brilliant scientific discoverers all over the civilised world, and we in this country had had our share of the most eminent men of science that the world had ever seen.

The Dyestuffs Industry

He could not help feeling that Lord Balfour's mind had been influenced by the fact that was dinned into our ears with monotonous insistence that Perkin discovered "Mauve" and that the Germans developed the aniline dye industry. Some people seemed to think that the beginning and end of the chemical industry was the aniline dye industry. Personally, he had been connected with the chemical industry all his life, but it was only a few years ago that he had had anything to do with aniline dyes, and he had no patience with the view of some people that the aniline dye industry was the beginning and end of the chemical industry simply because some eminent Germans—whose services in the cause of invention and scientific development nobody wished to diminish the value of—developed in Germany an industry which, to a large extent, remained neglected in our own country.

It was not altogether fair to blame the British capitalist or the British inventor or the British chemist for the fact that that industry was not developed in this country. A careful examination of the Patent Laws as they used to exist would show the remarkable ingenuity, not of the scientists but of the "legalists" employed by our friends in Germany, who succeeded in tying up the industry in this country for many years in a way few people realised. It was not everybody who was prepared to enter into long and costly litigation with the powerful firms which were established on the Continent, and it was that which prevented anything in the way of development here. It was due to modern legislation and the fact that the war forced the development of the aniline dye industry in this country, that progress had been made. There was not so much mystery about the aniline dye industry as so many people imagined, nor had our German friends any monopoly either of knowledge or invention in this direction. In fact, British dyes and Scottish dyes had established a very sound industry, and he was glad to think that licences had been granted by British manufacturers of dyes even to the almighty people on the Continent.

Progress in Chemical Industry

Coming to the industry he was most familiar with, the alkali industry, Sir Alfred remarked that heavy chemicals were still the backbone of the chemical industries of the world. Humble their products might be—alkalies, acids, chlorine, etc.—but they still formed the staple commodities of the chemical industry. Tracing the history of the alkali industry, it was pointed out that this owed its origin to that great Frenchman Leblanc, one of a brilliant band of French inventors, but it was taken up in this country by a number of men, Sir Charles Tennant, Muspratt, Welldon, Deacon, and others. When his own father came to this country in 1868, he did so because England was a country in which there was no established chemical industry, which encouraged a young chemist, and he came with a process for the recovery of sulphur from alkali wastes. The first works he went to were the St. Rollox works, then managed by Sir Charles Tennant. There was a brilliant band of men in the alkali industry at that time, who employed their own capital in the application of their inventions. Later, the Leblanc process was displaced by another, invented by a Belgian, Solvay, a process that was being developed even to-day. Thus there was no finality in chemistry and chemical industry, and to-day, developments of that process were being worked out by his own company in a manner which kept very careful check upon the labour and fuel costs.

What British Chemists have Done

Having been brought up in an atmosphere of chemistry and chemical invention, he was intimately acquainted with the fruitful work and discoveries of his late father, who, in his time, certainly was a pioneer of chemical industrial invention in this country and in the world. (Applause.) He had a brilliant band of men around him in the development of the ammonia-soda process in all its ramifications, and in what would now be called a low-temperature carbonisation process, Mond gas and the recovery of sulphate of ammonia. Another process which his father developed, but abandoned because others were cheaper, was one for the recovery of the chlorine lost in the ammonia-soda process. That was technically successful, but it was found later that direct electrolysis of salt was more economical. There was also a process which was on the borderline of what was chemical and what was metallurgical, the nickel carbonyl process, by which nickel was extracted by means of CO, in gas form, and then re-deposited at a different temperature in the metallic form from the carbonyl in a continuous cycle. That was a truly chemical process, and one of the most remarkable ever discovered.

The great extension of the artificial silk industry was due to Cross and Bevan, and none of these many industries would be possible without the application of research and science, and none would have been possible had there not been people in this country who had been prepared to provide capital to develop the experiments and carry them to the industrial stage.

Advantages of Amalgamation

That was one of the advantages of combination. People had criticised large amalgamations of capital and management; he himself was responsible for the formation of the largest amalgamation in the chemical industry, and arguments could be produced for and against such amalgamations, but there was one thing which must be admitted, and that was that a large organisation combined more possible elements of talent in the technique of different processes and also more experience, and commanded more capital resources, than a smaller enterprise, even the best managed, could hope to have. That was an important factor in a period when chemical plant had become so expensive that it was not a question of hundreds of thousands of pounds sterling but perhaps of millions to erect the delicate and complicated machinery necessary. If an organisation was not prepared to spend hundreds of thousands of pounds in research it was bound to fall behind other companies which were in that position. He could say without any fear of contradiction that we had to-day in this country—and always had had—men of more ingenuity and more practical application of scientific principles to actual manufacture than were to be found in any other country in the world.

A British Chemist's Achievement

Some people looked upon pure research as a waste of time and money, but there was a striking instance during the war which showed that that was not the case. We were at one time in a serious position with regard to high explosives. Ammonium nitrate was essential for high explosives, and it was necessary to apply our minds to devising new processes. His firm had to do a large part of that work. In peace time the manufacture of T.N.T. was carried on to the extent of a few lbs. at a time, but the problem was to make it on an enormous scale, and methods were devised by which tons displaced pounds. In the same way picric acid was manufactured from phenol. Previously that had not been done in this country; it had been done in France, but owing to the energy and ability of some of his colleagues the problem was solved here without any assistance from abroad.

Much more important, perhaps, was the production of ammonium nitrate. There was no known method of making

this on the scale of hundreds of tons per day. Previously, a very eminent American physicist, Professor Willard Gibbs, had devoted a considerable portion of his research work to working out the Phase Rule, a purely scientific piece of work which, however, had no apparent relation to the particular problem, but from a study of that work it was found possible to work out a method. On his staff at that time—and he was pleased to say still on the staff—was an eminent and distinguished scientist, Major Freeth, who made a study of the scientific work of the late Professor Willard Gibbs and worked out a process for the manufacture of ammonium nitrate on a large scale which worked extremely well, produced thousands of tons, and really saved the Allied forces in the field.

A Vision of the Future

Passing to the future, Sir Alfred Mond referred to catalysis which, he said, had become the hand-maiden of very many industries, and when it was combined, as had been done, with high temperatures and high pressures, it was difficult to say where the chemist began, the engineer ended, or the physicist was installed. As a matter of fact, the co-operation of all three was required if we were to obtain the fullest knowledge on the subject. Then there was the bio-chemist, who was beginning to loom large in modern industrial chemistry, and especially in the great fermentation industries and bacteriological processes. Again, there was the fine chemical industry, and looking into the details, he did not think we had any reason to be ashamed of the work that had been done or was in progress in all these directions. Surveying the whole field, it could be said with confidence that, as far as the present position of chemical industry was concerned, it could claim an equality—he did not claim any more—with the chemical industries of any other country in the world. He had just spent 10 days floating in a ship on the Adriatic attending a nitrogen conference which was attended by experts from all over the world to discuss the application of nitrogen to the soil. No more human topic could be discussed, because it involved the improvement of the standard of living. It was only by the cheap production of synthetic nitrogen that we should be able to provide the cheap and plentiful supplies of food necessary which the world desired.

Another matter of vital importance was the liquefaction of coal. That was beginning to be a practical technical proposition. He did not suggest that in the near future all the petroleum wells of the world would cease to flow, but the petroleum wells were not inexhaustible, whereas the coalfields of the world were very much more extensive, and the work upon the liquefaction of coal which was being done opened up one of the most interesting chapters. Summing up, Sir Alfred said that it seemed to him that chemical industry at the present time was more far-reaching and extensive and interesting than it had been at any period in its history, and one of the regrets of his advancing years was that although he might see some of the promised land, there lay beyond a *terra incognita*, developments much more striking than anything we had yet been permitted to see, and he hoped the younger generation would continue the great traditions of British chemistry and British chemical industry. (Applause.)

Sir Richard Gregory, proposing a hearty vote of thanks to Sir Alfred Mond, said that whilst British chemical industry in the past had possessed the creative genius and practical knowledge, it lacked the confidence of the industrial world, and Sir Alfred Mond had given that confidence to the financial world in our industries.

At the afternoon session Colonel Pollitt presented a paper (which will appear in full in our next issue) on "Developments in the Heavy Chemical Industry."

Speeches at the Conference Dinner

The Conference dinner was held on Monday evening, at the Connaught Rooms, when Mr. F. H. Carr presided over an attendance of about 300 members. The Chairman expressed regret at the absence of the President of the Board of Trade (Sir Philip Cunliffe-Lister) and welcomed Mr. Herbert G. Williams (Parliamentary Secretary to the Board of Trade).

Mr. Williams, proposing "The British Chemical Industry," said that in the early days, when we spoke of chemistry we naturally thought of Germany, but to-day we thought of Great Britain. Between 1918 and 1922 certain legislation had been passed which had had a profound effect upon British chemical industry. He referred to the Dyestuffs Act and the Key Industries Act. As regards the former, the advantage it had been to the dyestuffs industry in this country was to be seen in the fact that whereas before the war we imported 80 per cent. of our dyestuffs requirements, to-day we only imported 20 per cent., and whereas before the war this country made only 3 per cent. of the world's production, to-day we make 10 per cent. Therefore, that legislation had been a great benefit to the industry without, in his opinion, injuring the consumer in any way. Whilst, however, British chemical industry had made great strides, he regretted to have to report that during the past 18 months the Board of Trade had had to remit the duty on 45 separate chemicals for the reason that they were not produced anywhere within the Empire, nor were they likely to be produced within a reasonable time. Another piece of legislation which had benefited British chemical industry was the withdrawal last year by the Chancellor of the Exchequer of the hampering and obsolete restrictions upon the use of alcohol for industrial purposes and in the same way he was convinced that the Petrol Tax of this year would prove to be of the greatest benefit to the country as a whole, if only for the reason that home-made benzol was free of this duty. In some remarks upon the wonderful work being done by Sir Alfred Mond for British industry, Mr. Williams said that behind that amalgamation there must be great inspiring people.

Sir Alfred Mond, in replying, referred to British chemical industry in terms which he elaborated at the conference. What we had done in the way of amalgamations here he said was small compared with what had been done in the United States. He once asked the chairman of one of the largest American corporations how he managed to run such a colossal business, and the reply was "I do not; it runs me." Genuine amalgamation aimed at eliminating wasteful and useless competition. As to the petrol tax, he believed this would have a far reaching effect as regards the utilisation of coal in this country in a liquid form. During the war, we had to import, at very great risks, large quantities of oil, but the problem of producing oil from coal was now in the realms of being solved, and the encouragement of the petrol duty would help that solution very considerably. Indeed, instead of being an importing country of oil we should, at no distant date, become self-contained as far as oil fuel was concerned.

Sir David Milne Watson, who also replied, gave several instances to show that Lord Balfour did little justice to British industry. Referring to high pressure gas reactions, he said that while great credit must be given to Haber, a very considerable share of credit was due to his English associate, Le Rossignol, for the part he played in overcoming the difficulties associated with the handling of gases under high pressure. The solution of those difficulties rendered possible not only the establishment of the synthetic ammonia industry but also the establishment of some of the new synthetic fuel processes. It might be claimed that in respect of synthetic ammonia, the enterprise of the English firm, whose head was Sir Alfred Mond, had practically placed us in a position of equality, and recent visits to Germany and to Billingham led to the conclusion that Sir Alfred Mond need have no fear of any comparison which may be made. The present high position of the gas industry was largely due to chemists, and it was likely that the gas industry would become more and more a chemical industry as time went on. In no other industry had the advantage of chemical control been recognised more fully, and the steady increase in the efficiency of gas production was due to the large increase in the number of chemists employed by gas undertakings who had much to do in maintaining the healthy condition of the industry in the face of severe competition. A natural result of this kind of control was that the industry was looking more and more to the research and investigations of chemists in order that its processes might be developed to give still more economic working in the future.

The final toast was "The Chairman," proposed by Sir Alexander Gibb (President of the Institution of Chemical Engineers) and briefly responded to by Mr. Carr.

Chemical Trade Returns for April

Improvement Maintained

THE Board of Trade Returns for April indicate that chemicals, drugs, dyes and colours were imported to the value of £1,443,373, an increase of £69,099 upon the corresponding period in 1927 and an increase of £108,596 on 1926; exports were valued at £1,955,092, an increase of £116,067 on the 1927 value and of £253,103 upon 1926; and re-exports were valued at £93,613, an increase of £3,650 on 1927, and a decrease of £2,336 on 1926. Following are the detailed returns :—

Imports

	Quantities Month ended April 30, 1927.	Quantities Month ended April 30, 1928.	Value Month ended April 30, 1927.	Value Month ended April 30, 1928.
CHEMICAL MANUFACTURES AND PRODUCTS—			£	£
Acid Acetic..... tons	985	1,230	44,716	56,696
Acid Tartaric .....cwt.	5,088	3,197	24,359	19,306
Bleaching Materials ,,	11,535	13,039	6,624	12,525
Borax..... ,,	7,841	16,555	8,675	14,111
Calcium Carbide... ,,	58,572	43,622	38,073	25,514
Coal Tar Products, not elsewhere specified value	—	—	190,137	47,337
Glycerine Crude ...cwt.	3,695	505	13,663	1,455
Glycerine Distilled ,,	747	594	2,692	2,104
Red Lead and Orange Lead .....cwt.	3,142	2,733	5,421	3,791
Nickel Oxide..... ,,	—	50	—	300
Potassium Nitrate (Saltpetre) .....cwt.	9,158	12,858	10,247	12,460
All other Compounds ,,	429,967	293,366	106,327	95,327
Sodium Nitrate ... ,,	134,222	106,595	84,243	61,465
All other Compounds ,,	41,717	41,808	23,254	29,319
Tartar, Cream of .. ,,	4,773	3,743	18,606	16,840
Zinc Oxide.....tons	888	883	27,980	27,375
All other Sorts....value	—	—	231,531	273,523
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	123,413	119,958	10,010	8,327
Bark Cinchona, etc. cwt.	1,389	1,880	6,528	9,544
Other Sorts .....Value	—	—	132,045	249,863
DYES AND DYESTUFFS, ETC.—				
Intermediate Coal Tar Products .....cwt.	13	60	411	672
Alizarine ..... ,,	52	45	1,190	2,429
Indigo, Synthetic.. ,,	27	—	183	—
Other Sorts ..... ,,	2,199	3,339	61,956	92,567
Cutch ..... ,,	6,432	4,701	10,438	7,751
All other Sorts .... ,,	4,427	7,296	13,924	20,671
Indigo, Natural ... ,,	18	—	500	—
Extracts for Tanning ,,	138,665	146,239	138,002	161,814
PAINTERS COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe.....cwt.	58,732	60,832	13,051	13,150
White Lead (dry).. ,,	13,046	10,111	22,804	15,807
All other Sorts ,,	82,021	114,694	126,684	161,330
Total of Chemicals, Drugs, Dyes, and Colours .....value	—	—	1,374,274	1,443,373

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—			£	£
Acid Sulphuric ....cwt.	1,868	1,615	2,326	2,125
Acid Tartaric ..... ,,	1,444	2,345	8,208	16,041
Ammonium Chloride (Muriate) .....tons	247	391	6,799	8,651
Ammonium Sulphate—				
To Spain and Canaries tons	3,898	10,266	42,558	104,616
,, Italy ..... ,,	170	90	1,898	894
,, Dutch East Indies tons	189	1,298	2,165	13,967
,, Japan ..... ,,	3,853	7,020	43,430	72,250
,, British West India Islands and British Guiana tons	25	664	300	6,756
,, Other Countries ,,	4,879	6,653	56,584	69,963
Total ..... ,,	13,014	25,991	146,935	268,446
Bleaching Powder (Chloride of Lime).....cwt.	23,131	43,883	10,098	16,236
COAL TAR PRODUCTS—				
Anthracene .....cwt.	1,500	220	800	121
Benzol and Toluol. galls.	523	232,076	59	11,783
Carbolic Acid ..... cwt.	6,325	23,359	13,188	41,078
Naphtha ..... galls.	1,734	4,575	235	433
Naphthalene ..... cwt.	282	5,508	661	2,606
Tar Oil, Creosote Oil, etc. gall.	8,470,676	123,784	274,468	6,353
Other sorts ..... cwt.	89,529	55,094	39,098	29,111
Total ..... Value	—	—	328,500	91,485
Copper, Sulphate of ..tons	4,661	6,646	100,901	154,766
DISINFECTANTS, ETC. cwt.	35,804	29,829	94,892	77,621
GLYCERINE, Crude .. ,,	4,554	3,357	13,938	10,027
Glycerine, Distilled .. ,,	4,714	8,066	23,654	30,725
Total ..... ,,	9,268	11,423	37,592	40,752
POTASSIUM COMPOUNDS—				
Chromate and Bi-chromate .....cwt.	2,843	3,158	5,029	5,760
Nitrate (Saltpetre) ,,	1,051	1,825	1,998	2,468
All other Sorts ... ,,	6,355	5,408	14,294	13,078
Total ..... ,,	10,249	10,391	21,321	21,306
SODIUM COMPOUNDS—				
Carbonate ——. cwt.	340,653	490,019	105,563	132,435
Caustic..... ,,	111,927	194,077	84,281	126,215
Chromate and Bi-chromate..... cwt.	3,116	3,675	4,110	4,870
Sulphate, including Salt Cake ..... cwt.	41,169	43,097	5,132	5,729
All other Sorts .... ,,	41,713	70,112	46,943	69,278
Total ..... ,,	538,578	800,980	246,029	338,527
Zinc Oxide ..... tons	70	121	3,166	4,579
All other sorts ....Value	—	—	238,541	294,253
Total of Chemical Manufactures and Products ..Value	—	—	1,245,308	1,334,878
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts ..... oz.	217,061	130,320	20,733	13,850
All other Sorts ... Value	—	—	200,199	225,868
Total ..... ,,	—	—	220,932	239,718
DYES AND DYESTUFFS—				
Products of coal tar cwt.	5,397	7,438	49,587	60,688
Other Sorts ..... ,,	6,015	9,496	6,815	8,551
Total ..... ,,	11,412	16,934	56,402	69,239
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ..... cwt.	504	9,647	276	2,245
White Lead (dry).. ,,	4,566	2,909	9,001	5,190
Paints and Colours, in paste form .....cwt.	45,654	46,269	98,561	88,328
Paints and Enamels Prepared .....cwt.	32,144	37,238	107,068	117,007
All other Sorts .... ,,	55,234	54,509	101,477	98,487
Total ..... ,,	138,102	150,572	316,383	311,257
Total of Chemicals, Drugs, Dyes and Colours....Value	—	—	1,839,025	1,955,092

Re-Exports

	Quantities Month ended April 30.		Value Month ended April 30,	
	1927.	1928.	1927.	1928.
CHEMICAL MANUFACTURES AND PRODUCTS—			£	£
Acid Tartaric .....cwt.	310	87	1,705	780
Borax..... ,,	116	26	125	40
Coal Tar Products value	—	—	458	15,694
Potassium Nitrate (Saltpetre) .....cwt.	37	2,658	61	2,403
Sodium Nitrate .. ,,	33,981	4,928	20,542	2,823
Tartar, Cream of .. ,,	296	337	1,416	1,682
All other Sorts...Value	—	—	10,143	24,385
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts.....oz.	19,455	17,537	2,342	1,924
Bark Cinchona, etc. cwt.	498	146	5,000	585
All other Sorts ...Value	—	—	35,458	32,116
DYES AND DYESTUFFS—				
Cutch .....cwt.	2,230	2,409	3,462	4,033
Otherdyeing extracts,,	232	226	1,961	1,172
Indigo, Natural ... ,,	3	27	87	296
Extracts for Tanning cwt.	1,882	898	2,914	952
PAINTERS' COLOURS AND MATERIALS.....cwt.	666	1,066	3,257	4,246
Total of Chemical Drugs, Dyes and Colours ...Value	—	—	89,963	93,613

International Nitrogen Conference

Further Papers

IN the last issue of THE CHEMICAL AGE an account was given of the papers delivered at the nitrogen conference (on board the steamer *Lutzow*, in the Adriatic) by Dr. Bueb and Mr. F. C. O. Speyer. Among those who joined in the discussion on Mr. Speyer's paper were Sir Daniel Hall and Professor H. E. Armstrong.

On the second day of the conference, Professor L. Brétignière (France) spoke on "Nitrogenous fertilisers and the working of the soil"; Sir Frederick Keeble, F.R.S., director of agricultural research to Imperial Chemical Industries, Ltd., dealt with "Research and education in their relation to practical agriculture" (Professor Armstrong joining in the discussion); and Professor Warmbold with "Natural and economic foundations of the application of artificial fertilisers."

The Oxidation of Ammonia

On the third day, Dr. Fauser dealt with the production of concentrated nitric acid by the oxidation of ammonia under pressure. He stated that the methods of synthetic production of nitric acid hitherto used did not permit of a direct attainment of high concentration, and were bound up with a large use of fuel, as well as a considerable loss of concentrated sulphuric acid on dehydration. A study had been made of the conditions suitable for the direct production of concentrated nitric acid by oxidation of ammonia under pressure. Platinum was used as catalyst, and the pressure and speed of gas-flow were varied, while different mixtures of air and nitrogen were used. By oxidation under pressure it was found that a distinct economy in platinum was achieved, while the dimensions of the cooling apparatus could be greatly diminished. The main advantage, however, lay in the plant for the absorption of the nitrous fumes. In confirmation of theoretical anticipations, the absorption towers could be greatly lessened in volume on working under pressure (*e.g.*, at 5 atmospheres the necessary volume was one-twentieth of that necessary at 1 atmosphere).

The author had also determined the absorption coefficients of nitrous fumes in nitric acid at various pressures and temperatures. The results were embodied in curves, showing the conditions favouring the production of a highly concentrated acid. Finally, he described the essential improvements and simplifications to which his experiments on the use of chromium-steel for the pressure plant had led, and showed the remarkable economy of the method in comparison with the usual installation.

Chemical Matters in Parliament

Benzol Production

The retained imports of benzol in 1927 amounted to 13,000,000 gallons, stated Sir Philip Cunliffe-Lister, in a written answer to Sir Hugh Lucas-Tooth (House of Commons, May 8). Precise figures of the production in this country in that year were not available, he stated, but the National Benzol Association had estimated that it amounted to approximately 26,000,000 gallons of refined benzol. The exports in 1927 amounted to nearly 2,000,000 gallons. Thus the consumption in 1927, apart from any changes in stocks, might be estimated at some 37,000,000 gallons, and of this amount nearly two-thirds were home produced.

Rating Relief for the Chemical Industry

In reply to a question by Mr. Kelly (House of Commons, May 14), Mr. H. Williams stated that comprehensive information regarding the amount of direct relief from taxation, under the Budget proposals, was not available, but for a few trades some approximate estimates had been made. The direct relief for the chemical industry would be about £600,000 a year, and for the heavy iron and steel industry about £550,000 a year.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

98. (*Obtaining Linseed Oil*)—A Spanish firm is anxious to know the best process for obtaining boiled linseed oil, and the products used for this purpose.

99. (*Hæmolin*).—An inquirer desires to get in touch with manufacturers of Hæmolin.

Bio-Chemical Conference at Birmingham

A MEETING of the Bio-Chemical Society was held at the University of Birmingham on Saturday, May 12. Members of the Institute of Chemistry and of the Society of Chemical Industry also attended at the invitation of the Council and of Professor Ling. The meeting opened during the morning with an inspection of the new Bio-Chemical Department, and luncheon followed. During the afternoon a Conference was held, followed by tea, at the invitation of the Society.

Professor Ling presided during the first part of the conference, and Professor Schryver in the latter part. Contributions were made by Dr. S. H. Edgar on "Experiments on the Composition of Blood in Acute Rheumatism"; Dr. S. McLean on "The Biological Examination of Irradiated Zymosterol for Vitamin A," this being the work of Dr. E. M. Hume and Dr. H. H. Smith; Dr. Butterworth, an account of joint work with Dr. Walker, on "The Fermentation of Citric Acid by Bacterium Pyocyaneus"; Prof. Ling on "Researches on the Polysaccharides"; Dr. F. W. Norris on "The Hemicellulose of Cereal"; Mr. A. G. Norman on "The Chemistry of the Pectins"; and Dr. W. L. Dulière on the "Estimation of Creatine in Alkaline Solution."

Appointments Vacant

RESEARCH CHEMISTS for the research establishments of the Department of Scientific and Industrial Research.—The Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, London, S.W.1. May 28.

HEAD of Department dealing with problems arising out of the use of artificial silk in conjunction with cotton, in the British Cotton Industry Research Association. Among the requirements is a knowledge of organic chemistry, and particularly the application of the methods of physical chemistry and chemical engineering thereto.—Also assistants in the departments.—Dr. R. H. Pickard, F.R.S., Director of Research, Shirley Institute, Didsbury.

WHEAT Chemist for the Wheat Research Institute, New Zealand.—The High Commissioner for New Zealand, 415, Strand, London, W.C.2. June 30.

From Week to Week

A FIRE at the paint and oil works of Alexander Ferguson and Co. Ltd., on the banks of the Clyde and Forth Canal, on May 10, caused damage estimated at £50,000.

IMPORTS OF CHEMICALS INTO RUSSIA in January were as follows :—Tanning materials, 4,300 tons; dyes and colours, 700 tons. The corresponding figures for December, 1927, were 6,000 tons and 500 tons respectively.

THE *Revue Générale des Matieres Colorantes*, which since the beginning of this year had been incorporated in *L'Industrie Chemique*, has resumed independent publication. The office is at 56, Faubourg Saint-Honoré, Paris.

IT IS STATED THAT S. INSTONE AND CO. are to erect a new coal distillation and benzol production plant at Bedwas, in proximity to their collieries there. An expenditure of between £300,000 and £350,000 is contemplated.

AN IMPERIAL PRIZE has been awarded to Dr. Heizaburo Kondo, lecturer in pharmaceutical chemistry of the Tokyo Imperial University, for a thesis entitled "A Study of Alkaloids contained in Plants Growing in this Country."

THE DIRECTORS OF THE DUNSTABLE PORTLAND CEMENT CO. have received an offer to purchase the whole of the ordinary shares of the company. The offer is being considered. The company has a capital of £1,200,000.

DR. STUART PENNYCUICK, formerly of Queensland, who, for the past six years, has been attached to the Adelaide University, is leaving Sydney for America on a Rockefeller Foundation Fellowship. He intends to spend 12 months in America and Europe, carrying out researches on colloidal metals.

THE STANDARD OIL CO. is to erect large works in Germany for the production of ethylene glycol under patents of the I.G. Farbenindustrie. Negotiations are in progress with Dr. Goldschmidt, of Essen, who also is producing ethylene glycol according to his own patents.

THE MIDLAND VARNISH, PAINT, AND COLOUR MANUFACTURERS ASSOCIATION has passed a resolution strongly protesting against the imposition of the duty on turpentine and white spirit on the following grounds :—(1) That it is a tax on the raw material of an important industry, amounting in the case of white spirit to 40 to 50 per cent.; (2) that it imposes on a single industry a burden which should be distributed more evenly over the whole country.

SIR DAVID MILNE-WATSON, governor and managing director o the Gas Light and Coke Co., was on Saturday, May 12, presented with a portrait of himself by Sir William Orpen, in recognition of the knighthood recently conferred upon him. The gift was subscribed for by co-partner employees of the company, and there was a gathering of about 13,000 at Olympia, London, W., for the presentation.

THE *Svensk Pappers Tidning*, the Swedish journal of the paper industry, has just reached the thirtieth anniversary of its establishment, and has commemorated the occasion by the publication of a special number. The number contains various articles of interest to paper chemists, each being followed by a summary of its contents in English. Another feature is the publication of a number of advertisements on paper produced by the various advertising firms.

THE SOVIET GOVERNMENT has issued a decree setting up a permanent committee on the "chemicalisation" of the national economy. The decree provides for the co-ordination, extension, and development of the work of chemical research in scientific institutes and factory laboratories, and for the adoption of measures to extend the chemical industry. The application of chemistry to agriculture is specially mentioned. Foreign chemists are to be invited to the U.S.S.R., and Soviet chemists will be sent abroad to study the latest achievements of pure and applied science.

ARTIFICIAL SILK NEWS.—Dr. Herbert Levinstein has resigned his directorship of the Nuera Art-Silk Co. It is not proposed to fill the vacancy so created.—An issue of shares in the Yorkshire Artificial Silk Co., Ltd. was made on Tuesday. Sir William J. Pope is to be special consultant to the company, and Dr. W. E. Bader, chemist to Bader Brothers, of Czechoslovakia, is joint managing director. Mr. B. Nelson Dadge, late chief engineer to L. B. Holliday and Co., Ltd., is consulting engineer. It is expected that the company will be producing in six months' time.

THE ARRHENIUS MEMORIAL LECTURE to the Chemical Society was delivered at the Royal Institution by Professor Sir James Walker, on Thursday, May 10. The first portion of his lecture dealt with Arrhenius's work on electrolytic dissociation, his association with Ostwald, Van 't Hoff and others, and led up to his appointment to the directorship of the Nobel Institute. In the concluding portion the lecturer contributed a sketch of the character of Arrhenius, enlivened with personal recollections. It was typical of him, he said, amid laughter, that Arrhenius never aimed at great experimental accuracy, holding it, indeed, to be a disadvantage when dealing with a general law.

IT IS REPORTED that, following borings commenced in November, 1925, considerable quantities of oil have been discovered in Baden, at Bienwalde, near Scheibenhardt, by the I.G. Farbenindustrie.

RECENT WILLS INCLUDE : Sir Edward Holt, chairman of Joseph Holt, Ltd., Manchester, £530,173. He left £5,000 of first mortgage 5 per cent. stock of Joseph Holt, Ltd., to the Manchester Radium Institute.

THE FORMATION of Australian Oil Industries, Ltd., is announced With a capital of £2,600,000 the organisation is to promote and carry on the Australian natural oil and gas industry in all its various branches.

A COURSE of three lectures on "Chemical Kinetics" will be given by Professor Max Bodenstein, of Berlin University, at University College, London, on May 31, June 1 and 4. Details are contained in our advertisement columns, page xix.

DR. A. W. GIBSON, who has been head of the department of engineering at Hull Municipal Technical College since July, 1924, was on Monday appointed principal of the Dudley Technical College (in succession to Dr. Grindley, resigned).

THE LINDE AIR PRODUCTS CO., of New York, are reported as having made a contract with Stone and Webster, of Boston, for the completion of a million dollar oxygen plant. The Linde Co. is an auxiliary of the Union Carbide and Carbon Corporation.

SOLIDOL CHEMICAL, LTD. announce that they are acquiring a freehold factory at Disney Street, Borough, London, S.E. to manufacture solid Lysol, Soliment and Creo-Garlic on a larger scale. All communications should meanwhile be forwarded to Solidol Chemical, Ltd., 16, St. Helens Place, London, E.C.3.

BEET SUGAR NEWS.—Mr. J. B. Talbot Crosbie, managing director of the Second Anglo-Scottish Beet Sugar Corporation, announced last week that his board had decided to reopen the Cupar factory as a refinery for dealing with raw sugar. While operating as a refinery its primary object would be for beet sugar.

THE MUSCLE SHOALS BILL, creating a Government corporation for the operation of a nitrogen factory, together with amendments which prevent the Government from manufacturing finished fertiliser was passed in the House of Representatives, Washington, on Wednesday, May 16 by 251 votes to 165.

THE UNDERFEED STOKER CO., LTD. inform us that in the past four months they have secured twelve contracts for the supply of class "L" stokers, two for class "A" stokers, and one for a class "E" stoker. Other contracts include a coal handling plant for the Primitiva Gas Co., Buenos Ayres, and an ash-conveying plant for forty boilers for the London Electric Railway.

UNIVERSITY NEWS.—*Liverpool :* The honorary degree of D.Sc. was conferred upon Dr. Robert Robinson, professor of organic chemistry at Manchester University, and professor-designate at University College, London, at the twenty-fifth anniversary celebrations of Liverpool University.—*Glasgow :* The honorary degree of LL.D. will be conferred upon Madame Curie on Commemoration Day, June 20.

ARRANGEMENTS FOR A LOAN of £—,000,000 to the Aktiengesellschaft für Kohleverwertung, the proceeds to be used for the development of the companies' gas distribution scheme, have been arranged by a consortium of American banks. The loan is for 25 years, and bears 6 per cent. interest. The Kohleverwertung company was formed in 1926 by the leading Ruhr coal mines to utilise the waste gas of the Ruhr coke ovens.

AN AGREEMENT HAS BEEN REACHED for the delivery of ferro-silicon from the plants at Bjoelvefossen, near Bergen, to a British group, represented, during the negotiations, by Tennant and Sons, of Oslo. The quantity to be delivered is at present unknown, but in view of the new contracts it is stated that the factory will use to the full its electric plant of 24,000 horse-power. The capacity of the Bjoelvefossen factories is estimated at about 25,000 tons of ferro-silicon.

IN THE REPORT FOR 1926-27 of Leeds University it is stated that arrangements have been completed for beginning a new wing for the textiles section of the clothworkers' buildings. This new wing will provide increased accommodation for the dyeing department and will also be able to house the laboratories of the British Silk Research Association. A scheme has been elaborated for enabling graduate students to carry on research work for higher degrees in the laboratories of the British Research Association for the Woollen and Worsted Industries.

THE TRANSPARENT PAPER CO., LTD., the prospectus of which appeared on Tuesday, has been formed to establish a new industry in this country by the manufacture of viscose transparent paper, similar to that now imported, and with a view to acquire for use in Great Britain and the Irish Free State certain formulæ, and also certain improvements in machinery specially designed or under the direction of the vendors of the formulæ, processes, and information. Bridge Hall Mills, near Bury, Lancashire, will be acquired. It is hoped that four tons a week will be produced in about six months' time. The capital is £400,000.

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British

ANALYSIS.—Analyses of the residual acid from nitroglycerin manufacture. W. Young. *J.S.C.I.*, May 4, pp. 126–130T.

APPARATUS.—Devices for increasing accuracy in weighing. F. C. Guthrie. *Nature*, May 12, pp. 745–746.

COMBUSTION.—The burning of carbon disulphide. II. The velocity of movement of flame in carbon disulphide-second combustible-air mixtures. A. G. White. *J. Chem. Soc.*, April, pp. 751–763.

GENERAL.—The reaction between monohydrated ferric oxide and hydrogen sulphide at 100° C. T. G. Pearson and P. L. Robinson. *J. Chem. Soc.*, April, pp. 814–823.

Autoxidation during slow combustion. E. W. J. Mardles. *J. Chem. Soc.*, April, pp. 872–885.

ORGANIC.—Chloroamines as halogenating agents. Iodination by a chloroamine and an iodide. A. E. Bradfield, K. J. P. Orton, and I. C. Roberts. *J. Chem. Soc.*, April, pp. 782–785.

The intermolecular condensation of acetylmethylanthranilic acid by means of phosphorus pentachloride and the formation of a complex *iso*cyanine dye. I. M. Heilbron, S. L. Holt, and F. N. Kitchen. *J. Chem. Soc.*, April, pp. 934–941.

A new synthesis of 4-amino-3-hydroxy-phenylarsinic acid. I. E. Balaban. *J. Chem. Soc.*, April, pp. 809–813.

The constitution of irigenin and iridin. W. Baker. *J. Chem. Soc.*, April, pp. 1022-1033.

United States

ANALYSIS.—Determination of sulphur dioxide in small amounts in the atmosphere. R. J. McKay and D. E. Ackerman. *Ind. Eng. Chem.*, May, pp. 538–542.

Total carbon in coal. A. R. Carr and A. M. Rente. *Ind. Eng. Chem.*, May, pp. 548–549.

Unification of bromination methods of analysis as applied to phenols and aromatic amines. A. R. Day and W. T Taggart. *Ind. Eng. Chem.*, May, pp. 545–547.

APPARATUS.—Design of fractionating columns. D. B. Keyes, R. Soukup, and W. A. Nichols, Jr. *Ind. Eng. Chem.*, May, pp. 464–466.

ARTIFICIAL SILK.—The Lilienfeld patents and their commercial importance: Ether silk and viscose making at low temperatures. C Claessen. *Rayon Journal*, April, pp. 24–25, 39–40.

CATALYSIS.—The synthesis of water over nickel and copper catalysts. The mixture effect and promoter action. F. E. Smith. *J. Phys. Chem.*, May, pp. 719–733. Copper, nickel, two mixtures of copper and nickel, a mixture of copper and alumina (all prepared by reduction of the precipitated hydroxides), and copper from the fused oxide (by reduction), were studied as catalysts, at temperatures between 75° and 180° C., and with an oxygen concentration of 2·4 per cent. Copper-alumina is the most efficient catalyst, and copper from the precipitated hydroxide the least.

FIRST AID.—Initial treatment of burns of the eye. P. Bartholow. *Amer. Dyestuffs Reporter*, April 30, pp. 281–282, 299.

GENERAL.—Some preliminary observations of the colouring matter of citrus juices. M. B. Matlack. *Amer. Journ. Pharmacy*, April, pp. 243–246.

A physico-chemical study of gum arabic. A. W. Thomas and H. A. Murray, Jnr. *J. Phys. Chem.*, May, pp. 676–696. A method of purification is described and certain properties investigated.

ORGANIC.—Synthesis of higher hydrocarbons from water gas. D. F. Smith, J. D. Davis, and D. A. Reynolds. *Ind. Eng. Chem.*, May, pp. 462–464. Water gas, in the presence of a catalyst consisting of metallic cobalt, manganese dioxide, and a small amount of metallic copper, yields both saturated and unsaturated hydrocarbons, ranging from methane up to solid paraffins. On the basis of small-scale experiments it is shown that each cubic meter of water gas yields about 66 grams of liquid hydrocarbons.

Preparation of butadiene. S. F. Birch. *Ind. Eng. Chem.*, May, p. 474.

PLANT.—The building of containers for severe service. T. McL. Jasper. *Ind. Eng. Chem.*, May, pp. 466–470.

German

ANALYSIS.—The determination of iron in red lead. H. Heinrichs. *Zeitschrift angewandte Chem.*, May 5, pp. 450–453.

APPARATUS.—A new micro-colorimeter and its application. H. Kleinmann. *Chemische Fabrik*, May 9, pp. 263–264.

Apparatus for determining the content of liquids, especially chlorine liquors and chlorine bleaching baths. K. Hintzmann. *Chemische Fabrik*, May 9, pp. 266–267.

CELLULOSE.—The structure of the crystalline part of cellulose. K. H. Meyer and H. Mark. *Berichte*, April 11, pp. 593–614.

Cellulose sulphate. W. Traube, B. Blaser, and C. Grunert. *Berichte*, April 11, pp. 754–767.

DYESTUFFS.—Advances in dyestuff chemistry in 1927. F. Mayer. *Chemiker-Zeitung* (supplement), May 9, pp. 52–68.

ELECTROCHEMISTRY.—Advances in electrochemical industry. R. Meingast. *Chemiker-Zeitung* (supplement), May 9, pp. 29–52.

FOOD.—Methyl alcohol in various alcoholic beverages. W. Seifert. *Oesterreichische Chemiker-Zeitung*, April 15, pp. 65–68.

GENERAL.—A simple graphical method for the determination of the natural course of distillation. H. Brandes. *Chemische Fabrik*, May 9, pp. 261–263.

More chemists in industry and management. New fields of activity for the chemist. The metal industry. II. Founding. W. Denecke. *Chemische Fabrik*, May 2, p. 247; May 9, pp. 265–266.

Contribution to the chemistry and technology of zirconium oxide. H. Trapp. *Chemiker-Zeitung*, May 9, pp. 365–366.

ORGANIC.—The action of sulphur chloride on diphenylamine. The preparation of trithiodiphenylamine and its derivatives. J. E. Orloff. *Zeitschrift für Farbenindustrie*, March, pp. 121–122. Trithiodiphenylamine, obtained by this reaction, has been nitrated to give a substance giving fast red shades on wool from an ammoniacal solution.

Synthesis of trimethybrasilone and tetramethylhæmatoxylone. P. Pfeiffer, O. Angern, E. Haack, and J. Willems. *Berichte*, April 11, pp. 839–843.

The preparation of vanillin from safrol. A. Wagner. *Chemiker-Zeitung*, May 9, p. 379.

The formation of thiazol derivatives in the treatment of amines with thiocyanogen. H. P. Kaufmann, with W. Oehring and A. Clausberg. *Archiv der Pharmazie*, April, pp. 197–218.

PIGMENTS.—Ultramarine. E. Gruner. *Zeitschrift angewandte Chem.*, May 5, pp. 446–450.

French

ANALYSIS.—The iodimetric determination of phosphorous acid, and the use of sodium bicarbonate in iodimetry. P. Carré. *Bulletin Société Chimique France*, April, pp. 461–464.

The determination of alcohols. A. Verley. *Bulletin Société Chimique France*, April, pp. 469–472.

The microchemical determination of calcium. F. Rogozinski. *Bulletin Société Chimique France*, April, pp. 464–469.

ARTIFICIAL RESINS.—Artificial resins: Glyptal and coumarone resins. J. H. Frydlender. *Revue Produits Chimiques*, April 15, pp. 241–246; April 30, pp. 281–286.

OIL FROM COAL.—Liquid fuels from coal. R. Chaux. *Bulletin Société Chimique France*, April, pp. 385–407.

ORGANIC.—Oxidation of glucose in alkaline solution by oxygen or atmospheric air: Formation of carbon monoxide. M. Nicloux. *Comptes Rendus*, April 30, pp. 1218–1220.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

288,662. Hydrogen or Gas Mixtures containing Hydrogen from Hydrocarbons, Manufacture and Production of. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 15, 1926.

Hydrocarbons or gaseous mixtures containing them are treated for the removal of organic and inorganic compounds of sulphur, and then partly burned with a gas enriched with oxygen and with the addition of water vapour. The proportions are so adjusted that the resulting mixture contains appreciable amounts of hydrocarbons. A further quantity of steam is added and the mixture passed over an activated catalyst, *e.g.*, nickel and aluminium oxide, so that the hydrocarbons are converted into carbon monoxide and hydrogen, or carbon dioxide and hydrogen. The carbon dioxide may then be removed.

288,665. Halogen Substituted Tertiary Aromatic Amines, Process for the Manufacture of. K. Carpmael and K. S. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 10, 1926.

Tertiary aromatic amines of the benzene or napthhalene series are treated in the form of aqueous solutions of mineral acid salts with halogens. The halogen atoms preferably enter in ortho position to the dialkyl-amino group, and to a lesser extent in para position. Examples are given of the conversion of dimethyl-*p*-toluidine into 1-methyl-3-chloro-4-dimethyl-aminobenzene, dimethyl-2-naphthylamine into 1-chloro-2-dimethylamino-naphthalene, dimethyl-aniline into *o*-chloro-dimethyl-aniline, tetramethyl-diamino-diphenyl-methane into 3 : 3^1-dichloro-4 : 4^1-tetramethyl-diamino-diphenyl-methane.

288,666. Vat Dyestuffs and Intermediate Products, Manufacture of. K. Carpmael and K. S. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 10, 1926.

1 : 1^1-dinaphthyl-8 : 8^1-dicarboxylic acid or a nuclear substitution product is treated with an acid condensing agent under moderate conditions until the reaction product is soluble in glacial acetic acid. The compounds obtained still contain a free carboxylic group and are probably benzo-benzanthrone carboxylic acids. The latter may be treated with alkaline condensing agents to obtain alkali-soluble products of the violanthrone isoviolanthrone type. The first condensation products may alternatively be treated with acid condensing agents to obtain compounds insoluble in alkalies, which are vat dyestuffs giving blue to grey shades on cotton. A number of examples are given.

288,673. Dyes and Dyeing. J. E. G. Harris, B. Wylam, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirling. Application date, December 31, 1926.

Vat dyestuffs have been treated in the presence of a metal with a tertiary organic base and an alkyl sulphuric acid halide, chlor-sulphonic acid, or other derivative of sulphur trioxide. (See Specifications Nos. 247,787 and 251,491, see The Chemical Age, vol. xiv, pp. 334 and 577.) It is now found that in these processes the alkyl sulphuric acid halide, chlor-sulphonic acid, or other derivative, may be replaced by the dichloride of pyrosulphuric acid ($S_2O_5Cl_2$), or pyro-sulphuryl chloride. The latter can be obtained from carbon tetrachloride and sulphuric acid or chlor-sulphonic acid. In an example, dimethyoxy dibenzanthrone and copper powder are added to a mixture of pyrosulphuryl chloride and pyridine, and the mixture raised to 60°C. The product is added to aqueous sodium carbonate, distilled in steam, and the residual liquor filtered to obtain the desired solution.

288,699. Soda Ash, Process and Apparatus for Recovery of. J. Holmes, Kilbarchan, Renfrewshire, H. A. Kingcome, 17, Doune Terrace, Kelvinside, Glasgow, and J. L. Jardine, Esk Mills, Penicuik, Midlothian. Application date, January 11, 1927.

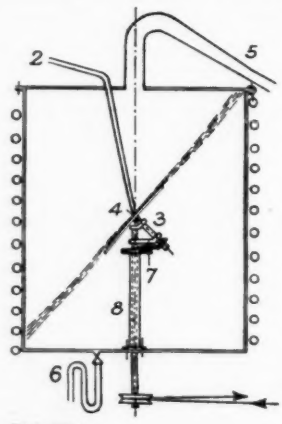
In this process, the heat value of the organic matter in the spent liquor from alkali treatment of cellulosic material is used. The spent liquor is discharged from the digesters direct into a closed receiver, and thence to a waste heat boiler, in which it is subjected to an initial concentration. The liquor is then further concentrated and sprayed into a stationery furnace, where it is incinerated. The heat produced by incineration is recovered in the waste heat boiler, and the steam generated from the spent liquor which is being concentrated is employed in the digesters and the soda recovery plant. The arrangements are such that the spent liquor from the digesters reaches the incinerator without exposure to the atmosphere.

288,707. Addition Products of Unsaturated Hydrocarbons of the Acetylene Series, Process for Producing. Verein für Chemische Industrie Akt.-Ges., 62, Moselstrasse, Frankfort-on-Main, Germany, and H. Walter, 69, Hauptstrasse, Mainz-Mombach, Germany. Application date, January 11, 1927.

The vapour which is to combine with the unsaturated hydrocarbons is employed in an amount greater than that theoretically required for the reaction, and is introduced with the unsaturated gaseous hydrocarbon into a liquid which consists of some of the first-mentioned substance and a mercury catalyst which renders the liquid acid. Thus steam and acetylene may be introduced into a dilute acid solution containing a mercury catalyst. The catalyst is not adversely affected by the reaction and the process may be made continuous. Examples are given of the production of acetaldehyde, ethylidene diacetate, ethylidene dipropionate, trichloracetic acid vinyl ester, ethylidene di-isobutyl ether, ethylene ethylidine ether, acetone, a mixture of acetone and acetic anhydride, and methyl-vinyl-iso-butyl ether.

288,775. Continuous Distillation, Evaporation or Separation of Difficultly Distillable Liquids, Process for. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 17, 1927.

The process is for distilling liquids such as crude tar, oils, saline, solutions, colloidal suspensions, etc., which usually require some preliminary treatment. The liquid is admitted



288,775

to the cylindrical still through a pipe 2, which discharges it on to the centre of a disc 4 mounted on an inclined shaft 3, which is rotated at 1,000 revolutions per minute by gearing 7 from a vertical shaft 8. The shaft 3 also revolves around the shaft 8 at 50 revolutions per minute. The spray thrown out by the disc 4 is in the form of an ellipse, the major diameter of which extends from the upper edge of the shell to the opposite lower edge, while the ellipse revolves about the vertical shaft, so that the liquid is distributed over the entire inner surface of the still. The walls of the still may be heated by steam, or by combustion gases, or electrically. Vapour is drawn off at 5, and liquid at 6. In the case of wet tars, the distillation is

practically steam-distillation. The distillation temperature of other substances in this apparatus can be lowered by adding a small proportion of a low-boiling liquid.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—261,393 (I.G. Farbenindustrie Akt.-Ges.) relating to hydrocarbons of the benzene series, see Vol. XVI, p. 91 ; 264,503 (I.G. Farbenindustrie Akt.-Ges.) relating to alkyl pyrazolones, see Vol. XVI, p. 317 ; 265,986 (J. R. Geigy Akt.-Ges.) relating to acid dyestuffs of the phenonaphthosafranine series, see Vol. XVI, p. 382 ; 271,521 (Berzelius Metallhütten Ges.) relating to electrolytic recovery of pure tin, see Vol. XVII, p. 15 (Metallurgical Section) ; 271,837 (Etablissements Poulenc Freres) relating to readily soluble organic salts of C-C-dialkyl and arylalkyl barbituric acids, see Vol XVII, p. 116 ; 276,317 (F. Krupp Akt.-Ges.) relating to steel alloys, see Vol. XVII, p. 39 (Metallurgical Section) ; 277,372 (I.G. Farbenindustrie Akt.-Ges.) relating to 1-methyl-2:5:6-trichloro-3-aminobenzene-4-sulphonic acid, see Vol. XVII p.467 ; 278,729 (I.G. Farbenindustrie Akt.-Ges.) relating to 1-amino-2:4-dimethyl-benzene and chlorine substitution products, see Vol. XVII, p. 536 ; 279,134 (I.G. Farbenindustrie Akt.-Ges.) relating to dinitrohalogen aryls, see Vol. XVII, p. 578 ; 279,436 (I.G. Farbenindustrie Akt.-Ges.) relating to dyestuff intermediates, see Vol. XVII, p. 579 ; 282,409 (I.G. Farbenindustrie Akt.-Ges.) relating to acid wool dyestuffs, see Vol. XVII, p. 183.

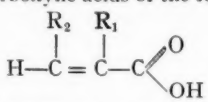
International Specifications not yet Accepted

286,669. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 8, 1927.

A halogenated anthanthrone is condensed with an aminoanthraquinone or a derivative or substitution product in presence of an acid binding agent, and copper or a copper compound, to obtain vat dyes. Examples are given.

286,685. BENZANTHRONE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 9, 1927. Addition to 268,830.

Specification 268,830 (see THE CHEMICAL AGE, Vol. XVI, p. 559) describes the condensation of oxygen containing reduction products of the anthraquinone series with unsaturated carboxylic acids of the formula



where R_1 represents any univalent residue such as alkyl aryl, aralkyl, acyl, aroyl, hydrogen, halogen, or hydroxyl, and R_2 represents a hydroxyl, alkoxyl, carboxyl, or like residue. The reaction is now applied to α-β-unsaturated carboxylic acids and esters thereof, in which R_2 is a residue such as hydrogen, alkyl, aryl, or halogen, and R_1 a univalent residue. Examples are given of the production of Bz1-oxybenzanthrone, β-anthronyl-β-methylcrotonic acid, β-anthronyl-β-phenyl-propionic acid, Bz1-oxy-Bz3- phenyl-benzanthrone sulphonic acid.

286,688. ETHERS. Schering-Kahlbaum Akt.-Ges., 170, Mullerstrasse, Berlin. International Convention date, March 9, 1927.

Di-ω-halogenacyl-diphenyl ethers are obtained by treating diphenyl ether or a derivative with a halogenated acyl halide. Therapeutic products are obtained by replacement of the ω-halogen atones with amino or substituted amino groups. Examples are given of the production of dichloracetyl-diphenyl ether and other substances.

286,694. DYE INTERMEDIATES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 9, 1927. Addition to 285,877. (See THE CHEMICAL AGE, Vol. XVIII, p. 417.)

2-Chlor-6-nitro-1-benzoic acid is treated with ammonia or the corresponding alkyl, aralkyl, or arylamine in the presence of copper powder to obtain 2-amino- or substituted amino-6-nitro-1-benzoic acids.

286,708. SULPHURIC ACID. Selden Co., 339, 2nd Avenue, Pittsburg, U.S.A. (Assignees of A. O. Jaeger, 25, North Grandview Avenue, Crafton, Pittsburg, U.S.A.) International Convention date, March 10, 1927.

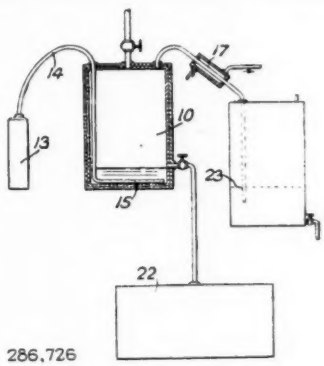
A catalyst for the oxidation of sulphur dioxide is combined with a base exchange body, *e.g.*, silicates of two or more metals of which one may be a heavy metal. The catalyst may be a metal of the 5th or 6th group such as vanadium, molybdenum, tungsten, uranium, chromium, manganese, arsenic, antimony, tantalum, niobium bismuth. An activating substance may also be added. Platinum and vanadium compounds are particularly suitable as catalysts.

286,717. DYES. I. G. Farbenindustrie Akt.-Ges, Frankfort-on-Main, Germany. International Convention date, March 10, 1927.

Tetrazotized 4 : 4^1-diamino-diphenyl-3 : 3^1-dicarboxylic acid or a derivative is coupled with an arylnaphthyl-aminosulphonic acid or a derivative and with another coupling component containing a sulpho, carboxyl, hydroxy, amino, or ketomethylene group causing solubility in water. The couplings may be in presence of pyridine, and the dyeings may be treated with metallic salts to increase fastness. Some examples are given.

286,726. CHLORINATING GASOLINE. International Fireproof Products Corporation, 2,500, Park Avenue, New York. (Assignees of F. S. Vivas, 2500, Park Avenue, New York.) International Convention date, March 11, 1927.

Gasoline is agitated with sodium hydroxide and the heavy oil products removed. The remainder is mixed with per-



286,726

chlormethane aqueous ammonia and aluminium or ferric chloride. Chlorine from a retort 13 is passed through the liquid from a perforated pipe 15, and hydrochloric acid gas is evolved and passes through a cooler 17 to an absorber 23 containing water. When the density of the product in vessel 10 reaches 1.32, it is run into a vessel 22 and washed with sodium hydroxide. The chlorinated product can be used for cleaning and as a constituent of paints.

286,730. HEXAMETHYLENE TETRAMINE. Schieferwerke Ausdauer Akt.-Ges., 11, Am Ueberlandwerk, Probstzella, Thuringia, Germany. International Convention date, March 10, 1927.

Formalin is run slowly into a solution of ammonium chloride supersaturated with sodium bicarbonate, or a solution of sodium chloride and ammonium bicarbonate. The product contains hexamethylene tetramine, sodium and ammonium chlorides, and can be used in the manufacture of artificial resins.

287,050. DYES. I.G. Farbenindustrie Akt.Ges., Frankfort-on-Main, Germany. International Convention date, March 12, 1927.

2-Aroyl-benzanthrones are treated with aluminium chloride, with or without the presence of diluents and oxygen, to obtain 4:5:8:9-dibenzopyrene-3:10-quinones. To obtain the 2-aroyl-benzanthrones, benzanthrone-2-carboxylic acid (Specification 277,670, THE CHEMICAL AGE, Vol. XVII, p. 467) is converted into its chloride and condensed with an aromatic hydrocarbon.

287,064. ALIPHATIC ACIDS. W. J. Hale, Midland, Mich., and W. S. Haldeman, Monmouth, Ill., U.S.A. International Convention date, March 12, 1927.

Primary alcohols of boiling point below 350° C. are vaporized and treated with a reduced metal to dehydrogenate them, and the aldehyde is then immediately oxidised to acid by treating with the unreduced metal oxide. A promoter may be used, *e.g.*, cuprous oxide containing 1% of silver. An example is given of the production of acetic acid, and formic, propionic, butyric, and other aliphatic acids are also obtained.

LATEST NOTIFICATIONS.

289,832. Distillation of tar. Barrett Co. May 3, 1927

289,879. Processes for the manufacture of sulphuric anhydride and sulphuric acid. Verein für Chemische Und Metallurgische Produktion. May 5, 1927.

289,807. Process for the manufacture of dyestuffs of the anthraquinone series. I.G. Farbenindustrie Akt.-Ges. May 2, 1927.

289,885. Method of purifying gases from sulphuretted hydrogen by decomposing the latter into hydrogen and sulphur. Fischer, Dr. F. May 5, 1927.

289,853. Manufacture of cellulose esters. Kodak, Ltd. May 4, 1927.

289,890. Manufacture of hard highly porous adsorbent gels. Silica Gel Corporation. May 6, 1927.

289,841. Process for the production of halogen-substituted organic sulpho-acids and their salts. Oranienburger Chemische Fabrik Akt.-Ges. May 3, 1927.

289,859. Process for bleaching and hardening resins. Cordes Akt.-Ges., C. May 4, 1927.

289,895. Process for producing photoprints and photo-copies. I.G. Farbenindustrie Akt.-Ges. May 6, 1927.

289,863. Emulsification, purification, cleaning, wetting, and like processes. Oranienburger Chemische Fabrik Akt.-Ges. May 4, 1927.

290,174. Process for the manufacture of titanium compounds. I.G. Farbenindustrie Akt.-Ges. May 6, 1927.

290,175. Process for the hydrogenation of the homologues of aniline. I.G. Farbenindustrie Akt.-Ges. May 7, 1927.

290,177. Production of resist effects in dyeing with vat-dyestuffs. I.G. Farbenindustrie Akt.-Ges. May 6, 1927.

290,178. Vulcanisation of rubber. Soc. of Chemical Industry in Basle. May 7, 1927.

290,179. Manufacture of dyestuffs. Soc. of Chemical Industry in Basle. May 7, 1927.

Specifications Accepted with Date of Application

265,213. Metals, Purification of. Kaiser Wilhelm Institut fü Eisenforschung. January 27, 1926.

265,948. Methyl alcohol, Production of—by catalysis. Soc. Francaise de Catalyse Generalisee. February 9, 1926.

270,705. Hydrocarbons, Process for the Manufacture and Production of. I.G. Farbenindustrie Akt.-Ges. May 10, 1926.

283,949. Aluminium, Production of—by fusion electrolysis. I.G. Farbenindustrie Akt.-Ges. January 21st, 1927.

289,544. Dyestuff intermediates, Production of. H. A. E. Drescher, J. Thomas and Scottish Dyes, Ltd. January 28, 1927.

289,556. Treating oils and other similar hydrocarbons to promote cracking. F. B. Dehn. (*M. B. Schuster.*) January 31, 1927.

289,564. Triarylmethane, dyestuffs, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) February 1, 1927.

289,571. Diaryl ketones, Obtaining derivatives of. British Dyestuffs Corporation, Ltd., W. H. Cliffe, F. W. Linch, and E. H. Rodd. February 5, 1927.

289,585. Ketones of the anthracene series, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 16, 1927.

289,621. Montan wax, Purification of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 8, 1927.

289,639. Aluminium oxide or products containing aluminium oxide from material containing aluminium sulphide, Production of. T. R. Haglund. May 3, 1927.

289,673. Heavy hydrocarbons into hydrocarbons of lower molecular weight, Conversion of. A. D. Smith and J. Perl. July 12, 1927.

289,692. Condensation products of the naphthostyril series, Manufacture of. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) September 6, 1927.

289,493. Metal derivatives of β-diketones. British Dyestuffs Corporation, Ltd., and S. Coffey. October 28, 1926.

Applications for Patents

Auer, L. Solidification of organic isocolloids. 13,547. May 8.

Auer, L. Manufacture of artificial materials from organic isocolloids. 13,548. May 8.

Auer, L. Modifying organic isocolloid materials. 13,694. May 9.

Auer, L. Vulcanisation, etc. 13,791. May 10.

Auer, L. Sulphurisation of organic isocolloids. 13,858. May 10.

British Dyestuffs Corporation, Ltd., Steam flow meters. 13,457. May 7.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of 1-amino carbazole, etc. 13,422. May 7.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of stable diazo compound. 13,541. May 8.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Vulcanisation of rubber. 13,542. May 8.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Conversion of metallic salts. 13,543. May 8.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of betaine thiocyanate. 13,544. May 8.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Amalgam salts. 13,545. May 8.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial rubber, etc. 13,704. May 9.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of emulsions. 13,705. May 9.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of potassium. 13,706. May 9.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of nitro compounds of di-naphthalene dioxide, etc. 13,707. May 9.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of cellulose derivatives. 13,708. May 9.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of a substance containing colloidal silver chloride. 13,812. May 10.

Coles, S. O. Cowper-. Electrodeposition of metals. 13,994. May 12.

Gordon, K., and Imperial Chemical Industries, Ltd. Apparatus for hydrogenation of coal, etc. 13,989. May 12.

Gordon, K., and Imperial Chemical Industries, Ltd. Heating hydrogen, etc. 14,058. May 12.

Graesser-Monsanto Chemical Works, Ltd., and Hudson, D. P. Separation, etc., of aromatic hydroxy compounds. 13,873. May 11.

Graesser-Monsanto Chemical Works, Ltd., and Hudson, D. P. Production of 3-alkoxy-4-hydroxy benzaldehydes, etc. 13,990. May 12.

Graesser-Monsanto Chemical Works, Ltd., and Hudson, D. P. Separation, etc., of aromatic hydroxy acids. 13,991. May 12.

Hackford, J. E. Low-temperature carbonization of coal, etc. 14,006. May 12.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of lacquers, films, etc. 13,405. May 7.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Insulation and securing of coil windings of lacquered wire. 13,649. May 9.

I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Hectograph compositions, etc. 13,769. May 10. (March 16, 1927.)

I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Manufacture of vulcan fibre. 13,914. May 11.

I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Manufacture of viscous oils from brown-coal tars, etc. 13,915. May 11.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Measuring humidity of gases, etc. 14,016. May 12.

I.G. Farbenindustrie Akt.-Ges and Mond, A. L. Multistage apparatus for mixing, etc. 14,029. May 12.

I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of urea and formaldehyde. 13,404. May 7. (April 24.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of titanium compounds. 13,420. May 7. (Germany, May 6, 1927.)

I.G. Farbenindustrie Akt.-Ges. Hydrogenation of homologues of aniline. 13,421. May 7. (Germany, May 7, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of resist effects in dyeing. 13,434. May 7. (Germany, May 6, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphonic acids of 6-chloro-2-amino-1-methylbenzene. 13,827. May 10. (Germany, May 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of yellow monoazo-dyestuffs. 13,828. May 10. (Germany, May 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of viscose silk. 13,829. May 10. (Germany, May 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of urea and formaldehyde. 13,912. May 11. (February 28, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of colouring-materials. 13,913. May 11. (March 14, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of yellow azo-dyestuffs. 13,929. May 11. (Germany, May 11, 1927.)

Imperial Chemical Industries, Ltd. Production of materials in granular form. 13,588. May 9.

Imperial Chemical Industries, Ltd., Mitchell, A. E., and Smith, C. C. Production of nitric acid. 13,724, 13,725. May 10.

Imperial Chemical Industries, Ltd. Mitchell, A. E., and Smith, C. C. Working up tar sands. 13,891. May 11.

Laing, B., and Nielsen, H. Distillation of solid carbonaceous materials. 13,820. May 10. (December 4, 1926.)

Soc. of Chemical Industry in Basle. Vulcanisation of rubber. 13,436. May 7. (Switzerland, May 7, 1927.)

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 13,437. May 7. (Switzerland, May 7, 1927.)

Stamberger, P. Vulcanisation, etc. 13,791. May 10.

Stamberger, P. Sulphurisation of organic isocolloids. 13,858. May 10.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 6d. to 1s. 11d. per gall.; pyridinised industrial, 1s. 8d. to 2s. 1d. per gall.; mineralised, 2s. 7d. to 2s. 11d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, 2s. 3d. to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—2s. 8d. to 3s. per gall. 97/99.—2s. 7d. to 2s. 8d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works; Crude, 10½d. to 11d. per gall.; Standard Motor, 1s. 4½d. to 1s. 5d. per gall.; 90%, 1s. 5½d. to 1s. 6d per gall.; Pure, 1s. 9d. to 1s. 10d. per gall.

TOLUOLE.—90%, 1s. 4d. to 2s. per gall. Firm. Pure, 1s. 6d. to 2s. 3d. per gall.

XYLOL.—1s. 3d. to 1s. 11d. per gall. Pure, 2s. 4d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 7⅝d. to 8⅜d. per gall. Heavy, 8⅜d. to 8½d. per gall. Standard specification, 7d. to 7½d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9½d. per gall. Solvent 90/160, 1s. 1½d. to 1s. 2d. per gall. Solvent 95/160, 1s. 2d. to 1s. 8d. per gall. Solvent 90/190, 9½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 62s. to 67s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. per gall. 90/180, 3s. to 4s. 6d. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. 1½d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 10½d. to 2s. per lb. Less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 2½d. to 1s. 3½d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—8s. to 8s. 3d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—11s. 4d. to 11s. 7d. per lb.
BISMUTH CITRATE.—10s. 4d. to 10s. 7d. per lb.
BISMUTH SALICYLATE.—10s. 7d. to 10s. 10d. per lb.
BISMUTH SUBNITRATE.—9s. 7d. to 9s. 10d. per lb.
BISMUTH NITRATE.—6s. 7d. to 6s. 10d. per lb.
BISMUTH OXIDE.—14s. 7d. to 14s. 10d. per lb.
BISMUTH SUBCHLORIDE.—14s. 4d. to 14s. 7d. per lb.
BISMUTH SUBGALLATE.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. 1d. to 2s. 3d. per lb.; potassium, 1s. 9½d. to 1s. 11½d. per lb.; sodium, 2s. to 2s. 2d. per lb.; granulated ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—1s. 2d. to 1s. 3½d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. '730—11½d. to 1s. 0½d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 6d. to 2s. 9d. per lb. Green, 2s. 9d. to 3s. 2d. per lb.; U.S.P., 2s. 7d. to 2s. 10d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 16s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.
METHYL SULPHONAL.—9s. to 9s. 3d. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 4d. to 2s. 7d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 1d. to 2s. 4d. per lb., B.P.C., 1923—2s. 6d. to 2s. 7d. per lb. U.S.P., 2s. 4d. to 2s. 7d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 6½d. to 1s. 9d. per lb. Crystal, 1s. 7d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—10s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—8s. 3d. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—35s. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—26s. per lb.
BOURBON GERANIUM OIL.—18s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CASSIA OIL, 80/85%.—8s. per lb.
CITRONELLA OIL.—Java, 2s. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 10d. per lb.
CLOVE OIL.—5s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 16s. per lb.
LEMON OIL.—11s. 6d. per lb.
LEMONGRASS OIL.—4s. 3d. per lb.
ORANGE OIL, SWEET.—35s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 55s. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. per lb.; Japanese, 7s. 3d. per lb.
PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, May 17, 1928.

TRADE generally continues moderately good and prices on the whole are firm. Export business is maintained with quite a fair volume of inquiry on forward account.

General Chemicals

ACETONE is unchanged and firm at £65 to £67 per ton.

ACID ACETIC is steady at £37 to £38 per ton for 80%, with a good demand.

ACID FORMIC.—Price is unchanged at £47 per ton for 85% and the improved demand recently noted is maintained. An advance in this market is not unlikely.

ACID LACTIC continues in fair demand at £43 per ton for 50% by weight for best pale quality.

ACID OXALIC is unchanged and firm at £31 to £32 per ton.

ACID TARTARIC continues firm at 1s. 4½d. to 1s. 5d. per lb. with a fair demand.

AMMONIUM CHLORIDE is unchanged at about £19 to £19 15s. per ton according to quantity and position.

ALUMINA SULPHATE is firmer at £6 7s. 6d. to £6 10s. per ton for 17/18%.

ARSENIC is unchanged.

BARIUM CHLORIDE is unchanged at £8 to £8 5s. per ton.

COPPER SULPHATE.—Quite a fair volume of business has been transacted on the basis of £26 per ton, less 5%.

CREAM OF TARTAR is unchanged, and in fair demand at £104 per ton less 2½ % for 99/100% B.P. quality.

FORMALDEHYDE is in good demand and price is steady at £39 to £39 10s. per ton for 40%, in casks.

LEAD ACETATE is firmer at £41 10s. to £42 10s. per ton for white with £1 per ton less for brown.

LEAD NITRATE is unchanged at £37 10s. per ton, business good.

LIME ACETATE is unchanged.

METHYL ACETONE.—Business continues firm and the price is unchanged at £56 to £58 per ton for 45% material with supplies distinctly on the short side.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged.

POTASSIUM CHLORATE.—Price unchanged at 3d. to 3½d. per lb. Market firm.

POTASSIUM PERMANGANATE is firm with an upward tendency at 5¼d. per lb. for B.P. with commercial at ¼d. per lb. less.

POTASSIUM PRUSSIATE is in fair demand at £59 to £60 per ton.

SODIUM ACETATE.—Supplies still short and price extremely firm at £21 15s. to £22 per ton.

SODIUM PHOSPHATE is a firm market at £13 per ton.

SODIUM PRUSSIATE is firm at 4¾d. per lb. to 5d. per lb. according to quantity and position.

SODIUM SULPHIDE is unchanged.

TARTAR EMETIC continues firm with a very active demand at 11½d. to 11¾d. per lb. Makers are well booked ahead.

ZINC SULPHATE is a bright spot, and the market is firm at £11 to £12 per ton.

Coal Tar Products

The market for coal tar products is fairly quiet, with little change to report from last week. With regard to benzols, solvents and heavy naphthas, the under-noted prices are being quoted, but little business is being transacted.

MOTOR BENZOL.—1s. 4½d. to 1s. 5½d. per gallon, on rails.

SOLVENT NAPHTHA.—1s. 1d. to 1s. 2d. per gallon, on rails, at works.

HEAVY NAPHTHA.—1s. 1d. to 1s. 2d. per gallon, on rails at works.

CREOSOTE OIL remains weaker, the price in the North for the forward position being 6½d. per gallon, on rails, while the price in London is 7d. per gallon.

CRESYLIC ACID is still weak, and the 98/100% quality is quoted at 2s. 6d. per gallon, f.o.b. naked, while the dark, 95/97% quality remains at about 1s. 10d. to 1s. 11d. per gallon.

NAPHTHALENES.—The 74/76 quality is quoted at £6 10s. per ton, and the 76/78 quality at £7 10s. to £8 per ton.

PITCH is unchanged at 60s. to 65s. f.o.b., U.K. ports.

Latest Oil Prices

LONDON, May 16.—LINSEED OIL steady and 2s. 6d. to 5s. per ton higher. Spot, ex mill, £31 10s.; June, £30 12s. 6d.; June-August, £30 15s.; September-December, £31 12s. 6d.; and January-April, £32 2s. 6d. RAPE OIL firm and 5s. per ton higher. Crude, extracted, £42 5s.; technical, refined, £44 5s., naked, ex wharf. COTTON OIL quiet. Egyptian crude, £34 10s.; refined common edible, £40; and deodorised, £42, naked. TURPENTINE easy for near. American, spot, 39s. 9d. taken and sellers; June 40s.; July-December, 42s. 3d. per cwt.

HULL, May 16.—LINSEED OIL.—Spot and May, £29 15s.; June-August, £30 2s. 6d.; September-December, £31 2s. 6d. per ton, naked. COTTON OIL.—Bombay crude, £31; Egyptian crude, £33; edible refined, £37; technical, £35; deodorised, £39 per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., £38 10s. per ton. GROUND NUT OIL.—Crushed/extracted, £39; deodorised, £43 per ton. SOYA OIL.—Extracted and crushed, £33; deodorised, £36 10s. per ton. RAPE OIL.—Crude/extracted, £40 15s.; refined, £42 15s. per ton. TURPENTINE.—Spot, 43s. 6d. per cwt. CASTOR OIL.—Pharmaceutical, 52s.; first, spot, 47s. 6d.; second, spot, 44s. 6d. per cwt., net cash terms, ex mill. COD OIL unaltered.

Nitrogen Products

Export.—The demand for sulphate of ammonia continues steady, and the price remains firm at £10 2s. 6d. per ton. f.o.b. U.K. port in single bags. There is still very little interest in forward positions; buyers are no doubt waiting for producers to announce prices.

Home.—It is reported that many merchants are still receiving orders for home delivery. If the reports are not unduly exaggerated, deliveries for the month of May should be very much higher than in previous years.

Nitrate of Soda.—The nitrate market remains steady. The price is subjected to small fluctuations in accordance with delivery points.

South Wales By-Products

THE feature of South Wales by-product activities during the past week has been a strengthening in the demand for refined tar, local authorities and road-making and repairing contractors placing good orders. Other products are quiet with no material change in values. Pitch is unchanged at from 65s. to 70s. per ton delivered, while crude naphthalene remains at 80s. per ton f.o.r., and whizzed naphthalene appears steady round about 90s. per ton f.o.r. Crude tar continues to change hands round about 50s. per ton f.o.r., while refined tars are unchanged despite the stronger demand. Coke oven tar continues to sell at 7¾d. to 8¼d. per gallon delivered in barrels, and gasworks tar at from 7¼d. to 8d. per gallon delivered. Patent fuel and coke exports continue to be quiet, but prices are unchanged, patent fuel (Cardiff) selling at from 21s. to 22s. 6d. per ton and from 20s. 3d. to 20s. 9d. from Swansea. Coke, best foundry, is unchanged at from 32s. 6d. to 37s. per ton, other sorts ranging from 25s. to 32s. 6d., and furnace coke from 19s. to 21s. per ton.

Casing Colourless by Coloured Glass

THE president, Mr. W. Butterworth, senior, occupied the chair at the meeting of the Society of Glass Technology held in Sheffield recently. A paper entitled "Some New Facts arising from a Study of the Casing of Colourless by Coloured Glass," by Dr. S. English, Professor W. E. S. Turner, and F. Winks, was read by Professor Turner. This was an account of work which had been proceeding for three or four years in the Department of Glass Technology of the University of Sheffield. Three series of glasses had been employed, the one being soda-lime-silica glasses coloured by cobalt oxide up to 0·49 per cent. The second consisted of potash-lead oxide-silica glasses, coloured by cobalt oxide up to 0·9 per cent., while the third series consisted of commercial soda-potash-lead oxide-silica glasses, colourless, ruby, green and blue. A number of important principles were established. The rate of thermal expansion in some glasses, such as the soda-lime-silica, soda-potash-lead oxide-silica, and soda-iron oxide-silica undergoes changes, not only at the lower annealing temperature, but also at one or more definite points below that temperature. In some glasses, especially lead oxide glasses, quite small amounts of colouring oxides appear to raise the lower annealing temperature substantially. Viscosity determinations in closed vessels do not necessarily afford a measure of the rate of setting of glasses worked under commercial conditions. This is specially true of coloured glasses. The rate of loss of heat from the outer layers, either of radiation or by conduction, must be taken into account.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinion.*

Glasgow, May 16, 1928.

THERE is little or no change to report in the heavy chemical market, and prices remain steady.

Industrial Chemicals

ACETONE, B.G.S.—£64 to £67 per ton, ex store according to quantity.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID, BORIC.—Crystals, granulated or small flakes, £30 per ton; powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC. ICE CRYSTALS.—In good demand and offered at 7d. per lb., delivered.

ACID CITRIC, B.P.—Quoted 1s. 11¾d. per lb., less 5%, ex store, spot delivery. Rather cheaper to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80% quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 10s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM LUMP POTASH.—Spot material available at about £9 per ton, ex store. Crystal meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5-cwt. casks, delivered, or f.o.b. U.K. ports.

AMMONIA LIQUID, 880.—Unchanged at about 2½d. to 3d. per lb delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Continental about £19 per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £16 15s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £19 7s. 6d. per ton, ex wharf, prompt despatch from mines. Spot material on offer at £20 2s. 6d. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers, £6 12s. 6d. per ton, delivered minimum 4-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price, £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Continental price unchanged at about £25 per ton, c.i.f. U.K. ports. Some British material available at about £25 per ton, ex store.

FORMALDEHYDE, 40%.—Offered at £35 10s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—Quoted £31 10s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports; brown, £38 10s. per ton, c.i.f. U.K. ports. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

METHYLATED SPIRIT.—Industrial quality, 64° O.P., quoted 1s. 7d. per gallon, less 2%, delivered.

POTASSIUM BICHROMATE.—4½d. per lb., delivered, minimum 4-ton lots. Under 4-ton lots ¼d. per lb. extra.

POTASSIUM CARBONATE.—96/98% quoted £25 10s. per ton, ex wharf, prompt shipment from the Continent. Spot material available at £26 10s. per ton, ex store.

POTASSIUM CHLORATE.—99/100% powder quoted £23 10s. per ton, c.i.f. U.K. ports. Crystals, 30s. per ton extra. B.P. quality, crystals or powder offered at £32 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s.6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6¾d. per lb.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton, and 70/72%, £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—In good demand and spot material scarce. Now quoted £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works, minimum 4-ton lots, Under 4 and over 2-ton lots 3 1/16d. per lb. Under 2-ton lots 3¼d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton delivered. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices now as follows:—Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot materia 4s. per ton extra.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. pe. ton f.o.b. U.K. ports; 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf, prompt shipment from the Continent.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Lead Tetraethyl Inquiry

Evidence about Tests

THE committee on lead tetraethyl in petrol continued its investigations, at the Office of Works, London, on Tuesday, Sir Frederick Willis presiding.

Dr. M. Coplans was examined in regard to a statement he had handed in. He had examined men employed at a garage, and also pieces of their overalls. In reply to a question, he agreed that he seriously suggested that those particular overalls were so laden with lead that it was dangerous to send them to a laundry. No comparison had been made with overalls from men using ordinary petrol. Dr. Coplans stated that considerable quantities of ethyl petrol had been spread on a monkey during a year, and at the end of that period the monkey showed no more sign of lead poisoning than did a monkey kept as a control and not treated with ethyl petrol.

Mr. H. S. Rowell, of the Research Association of the British Motor and Allied Manufacturers, said he had been concerned with Dr. Coplans in the experiments. He agreed that the two mechanics the last witness referred to might have obtained lead in their systems through soldering, of which they did a lot. Normally, mechanics had a clean overall each week but in this case the men had the same overalls throughout the tests. They were very dirty, which was partly due to the fact that they were constantly wiping their fingers on them. He did not think it was possible to detect whether ethyl petrol was being used, if the engine of a car was running in a garage. There was a quantity of lead chloride noticeable, on observing the exhaust pipe, but he would not agree that it was minute. In one exhaust there was a deposit of 290 grams, which mostly consisted of heavy flake.

The committee then adjourned to sit in camera, and is not expected to meet in public again until June.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, *May* 17, 1928.

The movement of chemicals on the Manchester market this week has about maintained the slightly improved position noted a week ago, although the demand from the cotton textile industries, as it has been for a considerable time, is much below normal. In other directions, however, inquiry for a number of the principal lines of heavy chemicals keeps up at a fairly satisfactory level, with the demand on export account still quiet. With regard to prices, these for the most part keep steady to firm.

Heavy Chemicals

There is a continued steady movement of caustic soda, more particularly against contract commitments, and makers' offer of this material are fully maintained at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality. A quiet trade is passing in the case of phosphate of soda, quotations for which range from about £12 to £12 10s. per ton. Inquiry for sulphide of soda is on the slow side and the undertone is easy, commercial grade selling this week at £7 17s. 6d. per ton, and 60-65 per cent. concentrated solid at about £10. Prussiate of soda retains its firmness, and a fair demand for this has been reported at from 4½d. to 5d. per lb., according to quality. A quietly steady trade is being done in alkali, and values are well held on a contract basis of £6 2s. 6d. per ton. Offers of nitrite of soda are not too plentiful at the moment, and quotations continue firm at from £19 10s. to £20 per ton. Hyposulphite of soda is in moderate demand, at about £16 5s. per ton for the photographic and £9 10s. for the commercial. There has been a quiet call for chlorate of soda, quotations for which vary from 2¾d. to 3d. per lb. A moderate movement is reported in the case of bichromate of soda and prices are steady at up to 3¼d. per lb. There is a quiet demand about for saltcake at from £2 12s. 6d. to £2 15s. per ton. Bleaching powder keeps fairly steady on the basis of £7 per ton in contract parcels, a moderate business being put through. Bicarbonate of soda is firm and in fair request at £10 10s. per ton.

Among the potash products, caustic remains firm at from £33 5s. per ton for prompt delivery of one to five-ton lots, though inquiry this week seems to have been rather slow. Carbonate of potash is quiet and on the easy side at about £25 per ton. Yellow prussiate of potash is well held at from 6¾d. to 7¼d. per lb. and meets with a moderate volume of enquiry. There has been little change in the position of chlorate of potash, offers of this material varying from 3d. to 3¼d. per lb. Permanganate of potash is in limited request, with the commercial quality obtainable at about 4⅝d. per lb. and the B.P. at 5d. to 5¼d. A quietly steady business is passing in bichromate of potash and prices are steady at round 4¼d. per lb.

The tendency in the case of arsenic seems to be easy on a limited demand for the product, and £17 5s. per ton at the mines for white powdered, Cornish makes, is about the top price to-day. Sulphate of copper remains very firm at up to £27 per ton, f.o.b., and a fair amount of buying interest continues to be shown. The movement of acetate of lime is rather slow, but there has been little further change in prices on the week, grey offering at £15 10s. to £16 per ton and brown at about £9 10s. The acetates of lead are quiet but steady at £39 per ton for brown and £40 for white, as is also nitrate of lead, current quotations for which are in the neighbourhood of £37 per ton.

Acids and Tar Products

There is a quiet demand about for citric and tartaric acids, the former being quoted here at 1s. 11d. to 1s. 11¼d. per lb. and tartaric at up to 1s. 4¼d. per lb. Oxalic acid meets with a certain amount of interest and values are steady at from 3¼d. to 3⅜d. per lb. With regard to acetic acid, this moves off in moderate quantities at steady prices, glacial being quoted at £66 to £67 and 80 per cent. commercial at £37 10s.

Buying interest in pitch is at a low level just now, and prices are easy at from £2 17s. 6d. to £3 per ton. Crude carbolic acid continues steady on comparative scarcity for early delivery at about 2s. 5½d. per gallon, and crystal also is well maintained on a fair demand at about 6½d. per lb. Creosote oil just now meets with a relatively small inquiry, and at about 7d. per gallon the tendency is easy. Solvent naphtha is in moderate request at round 1s. 2d. per gallon.

Pre-war Contract Claim

Case Before Mixed Arbitral Tribunal

The hearing was resumed, at a sitting of the Anglo-German Mixed Arbitral Tribunal, on Friday, May 11, Monday and Tuesday, the Court comprising Baron van Heeckeren, president, Dr. Heber Hart, K.C., British member, and Dr. Johannes, German member. of the case in which Donald Bagley, engineer, of the firm of Bagley, Mills and Co., of 92, Victoria Street, Westminster, brought a claim for the sum of £18,115, with interest at 5 per cent. from August, 1914, against Carl Still, a German national, in respect of coke ovens, benzol and other plant. A previous hearing of this case was reported in The Chemical Age of March 17.

On Tuesday morning Mr. Kohn said that the parties had taken the advice of the Tribunal on the previous evening, and had come to a complete settlement. There would be, with the permission of the Court, a consent judgment for £4,500 and £3,000 interest and £100 costs.

This was agreed to.

Claim by Worker Against Employers

In the Southwark County Court, on Tuesday, May 8, before Judge Moore, there was a claim under the Employers' Liability Act by Herbert Pettengell, of Bermondsey, against H. J. Enthoven and Sons, Ltd., lead manufacturers, of Upper Ordinance Wharf, Rotherhithe Street. It appeared from the statement of claim that on December 19 last the plaintiff began his job, of pumping caustic soda solution from one tank to another, when through the negligence of the charge hand, George Cutts, the flap or cover of the tank was raised without his knowledge. Owing to the steam from the hot liquid, he could not see where he was going, and stepped into the solution. Cutts gave no warning that the flap had been raised, and he alleged that it was through his negligence that the accident occurred. He received severe burns and scalding to the right leg. In all, he claimed £500. The defence, as filed, was that there was no negligence on the part of the defendants, or their servants. At the time the accident occurred, Cutts was pumping the caustic solution, and, in fact, they alleged the plaintiff took the flap off the tank himself. Alternatively, they alleged contributory negligence that the plaintiff should not have walked, or tried to have walked across the tank when his vision was obscured by the rising steam, and they also relied upon *volenti non fit injuria*.

When the case was called, it was announced that the parties had come to a settlement, that the plaintiff should receive £150 damages, and costs. Judge Moore agreed to the settlement.

Action Over Sale of Air Compressor

In the Bow County Court, on Friday, May 11, before Judge Snagge, Kemball, Bishop and Co., Ltd., of Mill Lane, Bromley-by-Bow, chemical manufacturers, sued Harry H. Gardam and Co., Ltd., of Church Street, Staines, to recover £25, the agreed price for a secondhand Worthington horizontal air compressor, or alternatively, damages sustained through its non-acceptance. The defence was that the air compressor was sold as being in first class condition, but it was broken, crudely patched, and the steam cylinder casting flange broken off. Mr. Martin, counsel for the plaintiffs, explained that the plaintiffs had used this air compressor for ten years to pump water from a well 300 ft. deep. In 1927 it was found that this well would have to be made 150 ft. deeper, necessitating a much more powerful air compressor. Whilst it had been in use the flange cracked, but to repair it a tie-rod was put over the crack, and that was plainly visible. It was advertised for sale, and Mr. Gardam inspected it, with Mr. Hepworth, of the plaintiff firm. A leakage was noticed, but Mr. Hepworth pointed out that all that was necessary was the usual packing, and it was sold as secondhand, and "as inspected by Mr. Gardam." Evidence was given in support of this, but for the defence evidence was called to the effect that the air compressor was very secondhand and was not sold as represented. It was "a sale by description," but was found not as described. Judgment was reserved.

Company News

BRITISH OIL AND GUANO.—The directors announce a dividend of 1s. 3d. per share, less tax, for the year.

ALLEN-LIVERSIDGE.—A dividend at the rate of 6½ per cent. per annum for the six months ended April 30 is announced on the preference shares.

CANNING TOWN GLASS WORKS.—The net profit for November 15, 1926 to December 31, 1927, amounted to £14,927. A sum of £7,427 is to be carried forward.

LEWIS BERGER AND SONS.—The directors have declared an interim dividend of 10 per cent. per annum, less income tax, on the ordinary shares for the half-year, payable on June 1.

DORMAN, LONG AND CO.—The directors have decided to pay an interim dividend at the rate of 6 per cent. less tax, on the cumulative preference shares, for the half-year ended March 31, payable on June 30.

NUERA ART-SILK CO.—A net loss of £28,140 is shown for the year ended December 31, 1927, which increases the debit balance to £42,667. The preliminary and formation expenses and underwriting commission amounting to £47,146 have been written off share capital premium account, leaving a balance on that account of £5,353.

ALIANZA CO.—A gross profit of £133,354 is shown for the year 1927. After providing £18,104 for exhaustion of raw material, £18,321 for depreciation, and deducting London and Valparaiso charges, taxes, etc., and adding transfer fees, net profit is £43,033, to which is added £171,701 brought forward, making a net balance of £214,734.

INTERNATIONAL HOLDING AND INVESTMENT CO.—At a meeting held in Montreal on May 9, the board adopted a resolution authorising by statutory modifications the splitting of each common share of no par value into ten common shares of no par value. A meeting of the shareholders to approve the splitting of the shares will be convened.

EASTMAN KODAK OF NEW JERSEY.—The directors have declared the following dividends, payable on July 2 to stockholders of record on May 31: Regular dividend of 1¾ per cent. on the preferred stock; regular dividend of $1.25 per share on the common stock, and extra dividend of $0·75 per share on the common stock. During 1927, the directors declared quarterly dividends of 1¾ per cent. on 6 per cent. preferred stock, regular quarterly dividends of $1.25, and four extra dividends of $0.75, or a total of $8, on each no par value share of common stock.

W. J. BUSH AND CO.—For the year ended December 31, 1927, the report states that the accounts show a gross profit of £255,636. After providing for debenture interest, expenses, and directors' remuneration, and making allowances for depreciation, there is a net profit of £58,950. To this is added £60,174 brought forward, making £119,124. The directors recommend a final dividend of 7 per cent. on the ordinary shares, making (with interim dividend already paid) 10 per cent. for the year, and a bonus of 6d. per share on the ordinary shares, placing to general reserve £20,000, and carrying forward £61,624.

TAYLORS (CASH CHEMISTS) TRUST.—The report from the period of incorporation, February 23, 1927, to March 31, 1928, the directors state that the balance of revenue account, after providing for directors' fees, secretarial and other expenses and income-tax, amounts to £130,053. After allowing for the dividends on the preferred ordinary shares, the directors recommend writing off the whole of the preliminary expenses and expenses of subsequent issues amounting to £59,693, and paying a final dividend on the deferred ordinary shares of 15 per cent., less tax (making, with the dividend already paid, 25 per cent., less tax), carrying forward £3,609.

UNITED PREMIER OIL AND CAKE CO.—The report for 1927 shows that dividends on investments received and receivable amount to £93,627, as compared with £62,063 for the previous twelve months. The provision to be made in respect of trading losses of subsidiary companies amounts to £10,780 as against £23,940 in the previous year. The report states that the question of depreciation of buildings, plant, machinery, etc., of subsidiary companies has been carefully considered by the directors, and, having regard to the accumulated reserves for depreciation made in previous years and to the fact that the plant, etc., of the various companies is still maintained out of revenue, they have not deemed it necessary, except in certain cases, to make any further provision for this purpose. The balance amounts to £79,542. Interest on debenture stock absorbs £21,334, and provision in respect of trading losses of subsidiary companies £10,780, so that £47,428 remains. The amount brought forward was £1,412, making a total of £48,840. The preference dividend to the end of the year amounts to £34,431, and the balance of £14,409 is carried forward.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS AND PHARMACEUTICAL PREPARATIONS.—An Indian firm of importers and exporters in Bombay are desirous of obtaining further agencies of British manufacturers. (Reference No. 445.)

BRONZE, LEAD AND ZINC, DISTILLED GLYCERINE, IODIDES AND SODIUM BICARBONATE.—An agent established in Buda-Pest desires to secure the representation, on a commission basis, of British houses. (Reference No. 464.)

CHEMICALS, GUMS, SIZES, TANNING AND OTHER RAW MATERIALS.—A British subject resident in Turin, who has secured the agency for the Montecatini glue and gelatine factory in Turin, is desirous of obtaining the representation of British manufacturers of materials used in the cotton, wool, silk, match, rubber and chemical industries. (Reference No. 466.)

TERRA COTTA PAINT.—Tenders are invited for the supply and delivery to Dock Road power station stores of 1,000 gallons (in five-gallon drums) of terra-cotta paint, suitable for painting electric light poles. Tenderers must submit full particulars and sample of paint. Sealed tenders, endorsed "Tender for Pole Paint," must be deposited in the Tender Box at the office of the City Electrical Engineer, Dock Road, Cape Town, not later than noon, June 13, 1928. No further particulars are available in the Department of Overseas Trade regarding this call for tenders, but British firms interested may wish to pursue the matter through their own channels.

Tariff Changes

UNITED KINGDOM.—*The Board of Trade Journal* for May 3, contains full details of the Customs Duty on hydrocarbon oils and on petroleum oils.

POLAND.—A refund of duty on dyestuffs and chemicals and raw materials for the manufacture of the dyestuffs imported into the country, may now be obtained.

LATVIA.—A translation of revised regulations respecting certificates of origin for goods shipped to Latvia in connection with the new Customs Tariff has been forwarded to this country and may be seen at the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

Duty on Iodo Oxyquinoline Sulphonic Acid

REPRESENTATIONS have been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding Yatren (iodo oxyquinoline sulphonic acid). Section 10 (5) of the Finance Act, 1926, deals with exemptions from duty. Any communications with respect to these representations should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, within one month from the date of this notice (May 16, 1928).

Radium Compounds Exempt from K.I.D.

THE Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, exempting radium compounds from Key Industry Duty from May 15 to December 31, 1928. The Treasury Order will shortly be published by the Stationery Office. The duty of 33⅓ per cent. on all imported radium was imposed in January last year.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

WEST, George Charles, 125, Como Road, Forest Hill, gelatine manufacturer. (C.C., 19/5/28.) £12 8s. 2d. March 29th.

ELLIS, W., 291, Derby Road, Bootle, paint manufacturer. (C.C., 19/5/28.) £10 7s. April 2.

PLAYLE, S. C., 59a, Ingrave Street, Clapham Junction (trading as CHELSEA DYE WORKS). (C.C., 19/5/28.) £26 11s. 8d. February 9.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

NORTHERN RENOVATORS, LTD., Manchester, dyers, etc. (M., 19/5/28.) Reg. May 4, £2,900 debenture, to Col. R. F. Ratcliff, Newton Park, Newton Solney; general charge. *Nil. November 18, 1927.

London Gazette, &c.

Partnership Dissolved

GYDE, BISHOP AND CO.(William Hill BISHOP and John Tuppen WOOLLRIGHT), dyers, Arundells Mill, Stroud, Gloucester, as from November 30, 1927, by mutual consent.

New Companies Registered

METAL PAINTS, LTD. Registered May 9. Nom. capital, £1,000 in £1 shares. To acquire certain patents for inventions relating to improvements in compositions adapted for use as paints, plasters, cements, etc., and to carry on the business of chemists, druggists, oil and colourmen. A subscriber: E. R. Gibbs, 62, Davies Lane, Leytonstone, London.

THE NUNNERY COKE AND GAS CO., LTD., Corn Exchange Buildings, Sheffield. Registered as a private company on May 10. Nom. capital, £50,000 in £1 shares. To acquire from the Nunnery Colliery Co., Ltd., the benefits and liabilities of the following contracts entered into by that company, so far as such contracts relate to and affect the company: (1) an agreement dated March 28, 1927, with the Sheffield Gas Co. for the supply of coke oven gas to that company for 12 years or longer on the terms and conditions therein contained, and (2) an agreement dated January 26, 1928, with the Woodall, Duckham Vertical Oven Construction Co. (1920), Ltd., being a contract for the erection by that company of coke ovens and other works for the supply of gas; to manufacture, sell and supply gas in Sheffield, and elsewhere to carry on the business of a gas works company in all its branches.

HERBERT ROBERTS, LTD. Registered as a private company on May 10. Nom. capital, £75,000 in £1 shares. To acquire the business of a dyer and finisher carried on by Herbert Roberts at Keighley, and to carry on the same and the business of shrinkers, clothworkers, waterproofers, and bleachers, makers of vitriol, dyeing and bleaching materials, etc. A subscriber: H. Roberts, "Fairmount," Woodville Road, Keighley.

THE YORKSHIRE ARTIFICIAL SILK CO., LTD. Registered as a public company on May 11. Nom. capital, £325,000 in 225,000 10 per cent. preferred ordinary shares of £1 each and 1,000,000 deferred shares of 2s. each. To enter into (1) an agreement with L. P. Ratcliffe, and (2) an agreement adopting an agreement dated March 9, 1927, between R. F. Bader on behalf of Bader Bros. of the one part and G. W. Turner of the other part, and to carry on the business of manufacturers of or dealers in artificial fibres and artificial silk manufactured by the viscose or by any other process, etc. A subscriber: O. J. Hook, 70, Holmwood Road, Seven Kings.

Institute of Metals

Forthcoming Liverpool Conference

THE Council of the Institute of Metals has just issued a preliminary programme of the four-day annual autumn meeting of the Institute, which is to be held this year in Liverpool. In the course of the twenty years of the Institute's existence most provincial centres and many foreign cities have been visited, but this is the first occasion on which Liverpool has received the members. The proceedings will begin on September 4 with a lecture on "Non-Ferrous Metals in the Shipping Industry," by Mr. F. G. Martin, B.Sc. The mornings of September 5 and 6 will be devoted to the reading and discussion of papers, and the afternoons to visiting works of interest in the neighbourhood, the Gladstone Dock and a large liner. On the evening of September 6 there will be a reception at the Town Hall by the Lord Mayor (Miss Margaret Beavan, J.P.). The meeting will conclude on September 7 with an all-day motor trip to North Wales, during the course of which it is expected that an electric power station and aluminium works will be visited.

In addition to the main reception committee (presided over by Professor C. O. Bannister, of Liverpool University), which is charged with the duty of making the general arrangements, a ladies' reception committee has been appointed for the entertainment of lady visitors. Ladies and members will be entertained to luncheon and dinner by the reception committee. Full particulars of the meeting, and membership application forms, can be obtained from the Honorary Local Secretary, Mr. H. F. Richards, B.Sc., 42, Bedford Street, Liverpool, or from the secretary of the Institute of Metals, Mr. G. Shaw Scott, M.Sc., 36, Victoria Street, London, S.W.1. Already a large number of applications, including many from the Continent of Europe and U.S.A., have been received from persons desirous of taking part in what promises to be an exceptionally interesting gathering.

Diphenylguanidine Patents Declared Invalid

ON April 9 the Supreme Court of the United States, in the Dovan vs. Corona infringement suit, which has been voluntarily defended by E. I. du Pont de Nemours and Co., declared the Weiss patent on diphenylguanidine and disubstituted guanidines invalid in its entirety. Without a dissenting opinion the court held, as contended by the du Ponts, that Weiss was not the original inventor. In another patent interference suit, the Court of Appeals of the District of Columbia, in re di-ortho-tolyl-guanidine, awarded the applied-for claims to the du Pont inventor, Scott, as a result of which the du Ponts expect the early issue to them of a patent covering the use of di-ortho-tolylguanidine as an accelerator of vulcanisation.

Benn Brothers' Other Journals

THE CABINET MAKER.—Metallic Bedsteads; Furniture Shipments in April; Furnishing Hardware.

THE ELECTRICIAN.—"Some Electrical Considerations," by C. B. Horsley; Automatic Traction Substations; Vertical Shrouded Switchgear.

THE FRUIT GROWER.—"Bark Ringing for Fruit Production"; New Menace to Hop Growing; Agricultural Wages Test Action.

GARDENING ILLUSTRATED.—The Chelsea Show; Novelties at Chelsea; The Primula Conference; How to Train Fruit Trees.

THE GAS WORLD.—Recovery Methods in Ammonia Production; Annual Meeting of the Society of British Gas Industries; The Use of Town's Gas in Industry.

THE HARDWARE TRADE JOURNAL.—Ironmongers' Federated Association's 31st Annual Conference at Harrogate; A Survey of Yorkshire; Hardware Goods and Summer Trade.

THE TIMBER TRADES JOURNAL.—The World's Soft Woods; Trade on the Pacific Coast; Board of Trade Returns; Finnish Manufacturers Reduce Output.